

A detailed map of the North Puget Sound region in Washington state, showing various islands, peninsulas, and waterways. The map is rendered in a light blue and white color scheme. Two diamond-shaped markers are placed on the map: one in the upper central area and another in the lower central area. The text of the title is centered over the map.

# NORTH PUGET SOUND LONG-TERM OIL SPILL RISK MANAGEMENT PANEL

FINAL REPORT AND  
RECOMMENDATIONS  
JULY 2000



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## I. Executive Summary

In August 1999 the U.S. Secretary of Transportation and the Governor of Washington State signed a Memorandum of Understanding (MOU) [Appendix 1] that established a long-term oil spill risk management panel for the waters encompassed by the Olympic Coast National Marine Sanctuary, the Strait of Juan de Fuca, and Puget Sound north of Admiralty Inlet. The Panel was established as a federal advisory subcommittee under the Navigation Safety Advisory Council (NAVSAC) and was composed of stakeholders from the region representing fishing, transport, environmental, geographical, and general public interests. The MOU recognized the value and environmental sensitivity of the region's waterways and acknowledged the extensive damage that would be done if a major oil spill were to occur.

The Panel first met in September 1999 and concluded in July 2000. NATIONAL CENTER ASSOCIATES of Vashon, Washington and selected staff of the Tacoma based CONFLICT RESOLUTION, RESEARCH AND RESOURCE INSTITUTE, INC. were selected to facilitate-mediate the Panel's process. The Panel was tasked with the development of a comprehensive, long-term oil spill risk management plan by building on previously completed risk assessment information. A Scope of Work [Appendix 6] was prepared consistent with the MOU and served as the Panel's guiding document. The Scope of Work detailed the basic methodology to be used along with specific topical areas to be covered during development of the plan. In retrospect, the original Scope of Work was quite ambitious and perhaps overly optimistic given the composition of the Panel and the short time frame available to complete the work.

The Panel sought to apply a risk-based decision-making process, with a goal of systematically identifying risk, establishing acceptable risk levels and developing appropriate risk mitigation strategies. A 4-step work plan was developed to review the existing safety system, identify measures to address any agreed upon "gaps" in the system, assess the effectiveness of these measures, then prioritize them accordingly. However, because of the complexities of this international waterway and existing safety regime and the difficulties in quantifying ecological sensitivities and values in a time frame responsive to Panel needs, plus the widely varying opinions on each of these factors, this approach to developing a risk management plan was not possible. In particular, the Panel was unable to reach consensus<sup>1</sup> on what an acceptable level of safety, or conversely what an acceptable level of risk was, and therefore, was unable to define specific gaps except in general terms.

Furthermore, because of the widely diverse makeup of the Panel membership, the first several meetings were largely utilized to establish an agreed upon evaluation process and a work plan; and then to educate, present and discuss data including necessary background information. The Panel did not conduct a full risk assessment, nor did it perform a thorough critique on previous studies, or works that addressed risk and risk assessments in the study area. However, the Panel did spend a significant amount of time reviewing the validity of previous work in order that it would be appropriately considered during development of the

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<sup>1</sup> Under the Panel's procedural rules [Appendix 5] agreement to any recommendation required either complete consensus, or at most, no more than two dissenting votes.



Panel's recommendations. The Panel did not endorse previous studies, and some Panel members were highly critical of various aspects of these studies.

Recognizing that this background work had consumed a great deal of time and a daunting task remained ahead, the Panel necessarily changed the work plan. Development of a comprehensive long-term risk management plan remained the ideal Panel goal, yet it was not considered attainable given time and budget constraints. Accordingly, the Panel decided to abbreviate the Scope of Work, and focus on the identification of risk reduction measures that addressed specific accident types and causes. Additionally, in recognition that a spill could still occur, the issue of spill response was also addressed.

The culmination of this work was the Panel's development of:

- A set of twenty-four consensus recommendations varying in scope and degree of significance aimed at improving marine safety. Each recommendation presented in Section VI is linked to the accident type and accident cause that it addresses, as well as the identification and description of the point at which it interrupts the error chain.<sup>2</sup>
- A set of documents capturing the essence of several additional challenging issues that did not achieve Panel consensus are presented as Other Measures Considered in Section VII. For each of these substantive issues for which consensus was not reached there is value in reporting the arguments in favor and opposed to specific recommendations.

These products represent the culmination of many months of valued efforts and discussions by Panel members. The Panel discussed each recommendation in detail, and a final vote was taken to determine whether a consensus had been reached. During these discussions Panel members developed a better appreciation of the technical issues and perspectives of the broader community. Under the Panel's procedural rules unanimous consensus of any recommendation was the goal, but acceptance was achieved if there were no more than two dissenting votes.

The twenty-four recommendations produced by the Panel address a broad spectrum of maritime safety concerns and intervene at every stage of the error causal chain. Each of the five accident types considered (collision, powered grounding, drift grounding, structural failure, and fire) and the five accident causes considered (human and organizational error, conflicting operations, physical environment, vessel control, and positional information) were addressed to some extent by one or more of the recommendations. The recommendations put forward constitute incremental safety enhancements, but by themselves or as a whole do not constitute a comprehensive long-term risk management plan.

Although consensus recommendations were not achieved on some of the more contentious issues, a broad appreciation for the complexities of these topics was gained. Most of the disagreement centered on the level of effectiveness and in particular whether the

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<sup>2</sup> A six-stage error causal chain is used throughout this report to illustrate the flow of events that can result in a vessel accident, which might lead to an oil spill. See p. 11.



recommendations costs were justified. Additionally, Panel members held dissenting views on the sufficiency of the technical substance that was considered and debated. Some Panel members felt the substance was lacking while others maintained the material presented and debated was thorough, complete, and resolved. The term resolution cannot be successfully applied to these issues. Accordingly, an attempt to capture this discussion has been included in the Other Measures Considered.

In summary, the recommendations would:

1. Establish a near-miss reporting system
2. Evaluate the marine safety regulatory baseline
3. Maintain the adequacy of the current marine safety regulatory baseline
4. Continue to develop marine safety Standards of Care (SOC)
5. Improve SOC for bridge team communications
6. Review the U.S. – Canada marine safety/environmental protection comparability analysis
7. Assure effective communications with local Marine Resource Committees (MRC)
8. Improve scope and effectiveness of inspection programs
9. Establish an education program for small vessels
10. Expand U.S. – Canada Cooperative Vessel Traffic System participation
11. Establish a trans-boundary process for maritime safety issues in Haro Strait and adjacent waters
12. Encourage towing vessel operators to meet industry standards
13. Develop a SOC for steering gear testing
14. Develop a SOC for offshore routing
15. Develop a SOC for planned maintenance
16. Develop a SOC for firefighting capability
17. Strengthen the partnership with Tribal Nations
18. Support the States/BC taskforce west coast offshore vessel traffic project
19. Support the Port Access Route Study (PARS)
20. Implement the Universal Automatic Identification System (UAIS)
21. Develop a SOC for anchor use
22. Expand the Olympic Coast National Marine Sanctuary “Area to Be Avoided” (ATBA)
23. Develop a SOC for vessel towing arrangements
24. Review oil spill response issues



Other Measures Considered were:

1. Establish a Regional Citizens Advisory Committee (RCAC)
2. Extend pilotage requirements westward to the entrance of the Strait of Juan de Fuca
3. Change Traffic Separation Scheme (TSS) from voluntary to mandatory for some vessels
4. Establish a fully developed Harbor Safety Committee
5. Deploy a year-round federally funded dedicated rescue tug at the entrance to the Strait of Juan de Fuca
6. Require tug escorts for high-risk vessel transits through the Strait of Juan de Fuca and Haro Strait

The Panel was successful at bringing together a widely diverse group of stakeholders and establishing a constructive dialogue. Considerable debate occurred over identifying and assessing the level of existing maritime risk and appropriate level of risk mitigation measures. Nonetheless, there was full Panel realization of a universally shared commitment for maritime safety and environmental protection in the Pacific Northwest.



## II. Endorsements/Non-Endorsements of Final Report

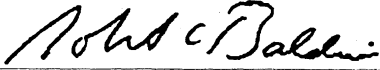
The signature page identifies those that endorse this final report of the North Puget Sound Long-Term Oil Spill Risk Management Panel. Six organizations did not endorse the report, and the views of individual Panel members appear in Appendix 16.

Endorsements	Non-Endorsements
American Waterways Operators, Pacific Region	Clallam County Board of Commissioners
Canadian Coast Guard	Makah Tribal Council
North Pacific Fishing Vessel Owners’ Association, Vessel Safety Program	People for Puget Sound
Office of Environmental Management City of Seattle	San Juan County Board of Commissioners
Pacific Coast Shellfish Growers	Washington Environmental Council
Puget Sound Pilots	Washington State Senator (D)
Puget Sound Steamship Operators Association	
U.S. House Representative (D)	
Washington Public Ports Association	
Washington State House Representative (D)	
Washington State House Representative (R)	
Washington State Senator (R)	
Western States Petroleum Association – Refining	
Western States Petroleum Association – Shipping	



**A. Endorsements of Final Report**

The following Panel members represent organizations that endorse the text of this final report:



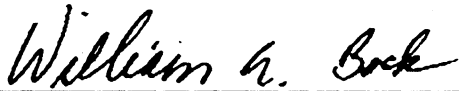
Robert Baldwin  
Marine Representative, Western States Petroleum  
Association – Shipping



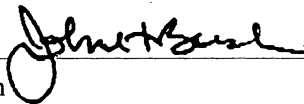
Kurt Beckett  
Representing US Congressman Norm Dicks (D)



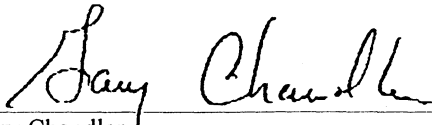
Paul Blau  
Board member,  
Pacific Coast Shellfish Growers Association



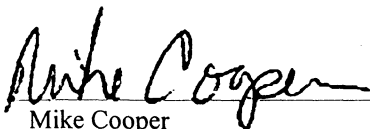
Captain William Bock  
President, Puget Sound Pilots



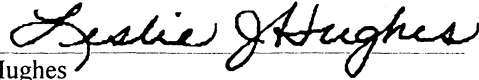
John Bush  
Representing the  
Washington Public Ports Association



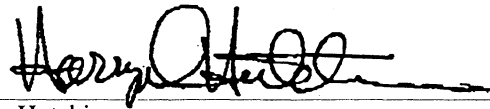
Gary Chandler  
Washington State Representative (R)



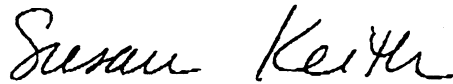
Mike Cooper  
Washington State Representative (D)



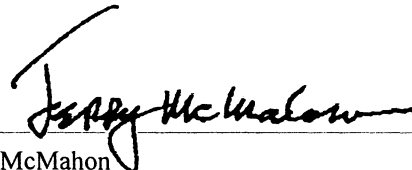
Leslie Hughes  
Executive Director, Vessel Safety Program,  
North Pacific Fishing Vessel Owners' Association



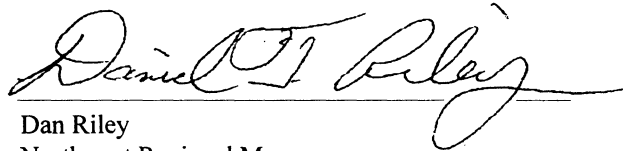
Harry Hutchins  
Executive Director, Puget Sound Steamship  
Operators Association



Susan Keith  
Director, Office of Environmental Management,  
City of Seattle



Jerry McMahon  
Vice President, Pacific Region,  
American Waterways Operators



Dan Riley  
Northwest Regional Manager,  
Western States Petroleum Association – Refining



Pablo Sobrino  
Director, Marine Programs, Canadian Coast Guard



Dan Swecker  
Washington State Senator (R)



## **B. Non-Endorsements of Final Report**

The following Panel members represent organizations that did not endorse this report:

Carole Boardman  
County Commissioner,  
Clallam County Board of Commissioners

Kathy Fletcher  
Executive Director,  
People for Puget Sound

Karen Fraser  
Washington State Senator (D)

Andy Palmer  
Representing the  
Washington Environmental Council

Rhea Miller  
County Commissioner,  
San Juan County Board of Commissioners

Gordon Smith  
Member,  
Makah Tribal Council



### III. Introduction

#### A. Memorandum of Understanding

In August 1999 U.S. Secretary of Transportation, Rodney Slater, and Washington Governor, Gary Locke, signed a Memorandum of Understanding (MOU) [Appendix 1] agreeing to develop a long-term oil spill risk management plan for the North Puget Sound area. The MOU acknowledged:

- The value and environmental sensitivity of the coastal resources encompassed by the Olympic Coast National Marine Sanctuary, Strait of Juan de Fuca, and Puget Sound north of Admiralty Inlet.
- The extensive damage that would be done to the State's economy, natural resources, and quality of life if these resources were ever affected by a major oil spill.
- Risk management analysis as an effective means of identifying and providing a sound basis for managing the risks in the marine transportation system.

Accordingly, there was an agreement that an inclusive process, in consultation with interested parties, would provide an effective means for developing a long-term oil spill risk management plan for area waters. Specifically, the U.S. Coast Guard and the Washington State Department of Ecology agreed to work in partnership as co-chairs of a subcommittee of the federal Navigation Safety Advisory Council (NAVSAC). This subcommittee, or "Panel," was designed to represent a cross section of diverse commercial, industrial, and public interests, with the goal of developing a long-term oil spill risk management plan for area waters. The MOU was the foundation for this Panel's work.

#### B. Risk-Based Decision-Making

The goal of risk-based decision-making is to systematically identify and document risks, establish associated acceptable risk levels or risk sensitivities, and develop appropriate risk mitigation or minimization strategies.

The study of risk and risk management is extremely complex with many comprehensive books written on the topic. There is no attempt here to address this topic in detail, but because risk terminology is an integral part of understanding the issues and recommendations, the following basic terms and concepts are provided as a foundation for discussions in other sections:

#### **Risk**

*Risk* is defined as the product of the probability of a hazard or undesired outcome occurring, times the consequence of occurrence (i.e., risk = probability x consequence).



## Risk Assessment

*Risk assessment* is the process of identifying and evaluating the hazards; including the characterization of risks by probability, consequence, and sensitivity to change. Risk assessment generally answers the questions:

- What can go wrong?
- What is the likelihood that it will go wrong?
- What are the consequences if it does go wrong?

## Risk Management

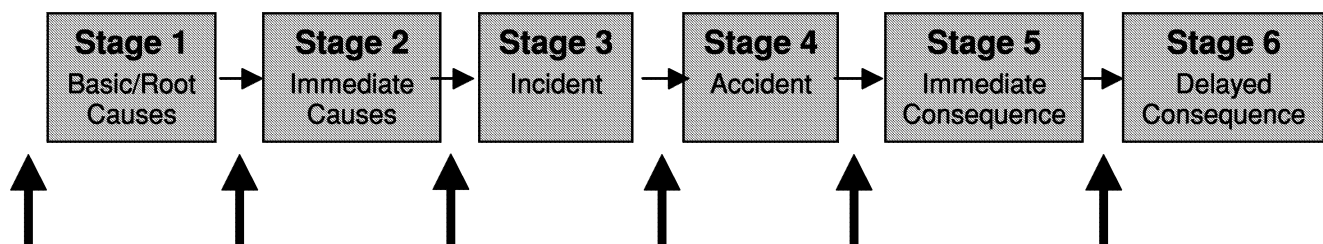
*Risk management* builds on risk assessment, and focuses on the most effective or cost-effective means of preventing situations and event sequences that contribute to accidents and the resulting losses. Risk management includes the identification, evaluation, and selection of risk mitigation or minimization efforts. Risk management answers the following questions:

- What can be done to prevent accidents and to minimize their consequences?
- What alternatives are available, and what tradeoffs must be made?
- How effective are the risk reduction safeguards?
- What are the impacts of current decisions on future operations?

## C. Error Causal Chain<sup>3</sup>

A six-stage (error) causal chain shown below is used throughout this report to illustrate the flow of events that can result in a vessel accident, which might lead to an oil spill. The key to risk mitigation in a system such as the marine transportation system is to manage risk by introducing appropriate risk-reduction interventions for each type of accident at each point in the error chain so as to prevent such a cascade.

### Error Causal Chain and Points of Intervention



During the process of identifying and evaluating measures aimed at interrupting the causal chain it was helpful to subdivide these measures into the two broad categories as defined below:

<sup>3</sup> Grabowski, Martha. "Risk Assessment and Management in the 21<sup>st</sup> Century Marine Transportation System." TR News July-August 1999, p. 15. The original causal chain was modified slightly for use in this report.



### **Accident Types**

Accident is defined as an unwanted or unintended event with undesirable consequences. The *accident types* used in this report are drawn from the Volpe Report,<sup>4</sup> they are collision, drift grounding, powered grounding, structural failure, and fire.

### **Accident Causes**

*Accident causes* used in this report are broadly defined categories that contribute to or cause accidents. These causes were also drawn from the Volpe Report and include human and organizational error, conflicting vessel operations, physical environment, vessel control, and positional information.

## **D. Previous Work**

The Panel spent a great deal of time considering the available risk assessment information and breadth of detailed, and at times, complex data and supporting information related to the marine transportation system and environmental sensitivities in the study area. Panel members had differing views regarding the validity of some of these reports and what they concluded. There was no attempt made to reach a consensus on the meaning and significance of these reports and presentations, instead each Panel member used the information presented to shape the formulation of his or her own recommendations and concerns.

The Panel was specifically directed by the Governor and Secretary not to repeat or formally evaluate the work of previous risk assessment studies. Rather, Panel members were asked to consider all available existing information, and then use it in conjunction with their own data, experience, and opinions to formulate a risk management plan. The Panel's methodology for developing a plan is discussed in Section IV-C.

## **E. The Panel**

Letters of invitation were sent to prospective Panel members in September 1999. Panel members were drawn from a diverse group of concerned stakeholders throughout the study area. Panel composition was intended to be inclusive of the broad set of constituent groups present in the study area. Panel membership was comprised of representatives from the organizations listed below:

1. Puget Sound Steamship Operators Association
2. North Pacific Fishing Vessel Owners' Association

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<sup>4</sup> Volpe National Transportation Systems Center, "Protection Against Oil Spills in the Marine Waters of Northwest Washington State," Department of Transportation, Cambridge, July 1997.



3. Western States Petroleum Association – Shipping
4. Western States Petroleum Association – Refining
5. Washington Public Ports Association
6. Puget Sound Pilots Association
7. American Waterways Operators
8. Makah Tribal Council
9. Washington Environmental Council
10. People for Puget Sound
11. Shellfish Grower’s Association
12. Clallam County Government
13. San Juan County Government
14. Seattle City Government
15. Washington State Senator (Democrat)
16. Washington State Senator (Republican)
17. Washington State Representative (Democrat)
18. Washington State Representative (Republican)
19. U.S. Congressional Staff
20. Canadian Coast Guard

Each member of the Panel brought a wide range of substantive issues, expertise, and concerns to the discussions. Appendix 2 is a detailed list of Panel members and their affiliation. Appendix 3 lists their interest statements.



## **IV. WORK OF THE PANEL**

### **A. Panel Process**

The Panel was established to act in an advisory capacity and to provide collective recommendations regarding potential improvements to marine safety and environmental protection in the north Puget Sound region. These recommendations will be given to the Secretary of Transportation through the Navigation Safety Advisory Council (NAVSAC) and to the Governor of the State of Washington. The Panel meetings were governed by the procedural rules required under the Federal Advisory Committee Act (FACA). Every effort was made to conform to these requirements.

In order to ensure a fair and equitable Panel process, a facilitation/mediation resource group, NATIONAL CENTER ASSOCIATIONS of Vashon, Washington was utilized. Also selected staff from CONFLICT RESOLUTION, RESEARCH AND RESOURCE INSTITUTE, INC. of Tacoma, Washington assisted with preliminary arrangements, and attended all Panel meetings.

Panel meetings were open to the public, but in order for the Panel to efficiently conduct its business, meetings were not considered to be an open public forum. Usually on two occasions during each day of Panel deliberations, members of the public were given an opportunity to address the Panel. This input was important to the Panel's decision-making process.

### **Composition**

Panel membership was determined through a cooperative process between the co-chairs with the desire that Panel membership would reflect the intent of the MOU, and that private and public interests would be included.

The composition of this Panel was unique in that it consisted predominantly of policy makers representing key stakeholders and not technical maritime experts. This reality afforded both an opportunity as well as a difficulty for the Panel. In a positive light this makeup ensured that issues of concern to stakeholders were brought to the forefront and discussed. Panel members were empowered to make decisions on behalf of their organizations. Interests and concerns identified by the members can be found in Appendix 3 and are important in that they illustrate both the similarities and the diversity present within the Panel, and highlight some of the difficulties faced in order to reach consensus on proposed measures. It was necessary to spend sufficient time to ensure all Panel members had a minimum baseline of information on each topical issue, sufficient time to express their concerns with the data and rationale, and ample time to struggle with developing and passing substantive recommendations.

### **Meetings**

Panel sessions were scheduled for two full consecutive days each month with the meeting agendas published in advance. The Panel met each month from September 1999 until July



2000, in Seattle, Olympia, and Port Angeles. Rather than composing detailed and lengthy minutes for each Panel session, abbreviated minutes (Summary Notes) were prepared and reviewed. Meetings from February 18 forward were also tape-recorded by the Department of Ecology in order to ensure a complete record.

### **Procedural Rules**

The Panel initially spent a considerable amount of time establishing the procedural protocol for its work. Under these procedural rules, agreement to any Panel initiative including the marine safety recommendations required either complete consensus, or at most, no more than two dissenting votes. Equity, inclusion and ownership of the process were emphasized to assure the greatest level possible of substantive satisfaction of the Panel members. In its initial meetings the Panel members agreed that the following documents set the foundation and provided guidance for its work:

- Memorandum of Understanding on the Development of a Long-Term Oil Spill Risk Management Plan for the North Puget Sound Area (MOU) [Appendix 1]
- North Puget Sound Long-Term Oil Spill Risk Management Panel of the Coast Guard's Navigation Safety Advisory Council (Purpose, Scope and Process Document) [Appendix 4]
- North Puget Sound Long-Term Oil Spill Risk Management Panel Procedural Agreements 9/24/99 [Appendix 5]

Based on these documents, and as directed by the MOU, the co-chairs developed and the Panel agreed to a North Puget Sound Oil Spill Risk Management Panel Scope of Work [Appendix 6]. This Scope of Work included a number of agreed principles, among them:

- Recognition that a cooperative and coordinated approach to marine safety is essential to effective oil spill prevention and response programs.
- Acknowledgment that the Panel was comprised of representative stakeholders with differing perspectives and values, and that the key to success would be to consider these perspectives in a comprehensive manner while striving to find common ground.
- Agreement that the Panel would employ a risk-based approach in making its decisions on how best to manage the oil spill risk (both in terms of probability and consequence) from commercial vessels operating in the region.
- Recommendations of additional oil spill risk reduction measures would be clearly linked to the stage of the risk event error causal chain and specify at which points intervention is made.
- Concurrence that the Panel would draw upon available studies, as well as other available information, and interpret their findings as necessary to formulate recommendations, but that the Panel would not redo these studies.



## **B. Guiding Principles**

### **Common Purpose**

The purpose of the Panel as stated in the Purpose, Scope and Process Document:

“The goal of the Long-Term Oil Spill Risk Management panel is to draft a plan that evaluates the existing safety system and makes recommendations regarding ways to improve marine safety in the North Puget Sound region. The panel will bring together a wide array of community representative and stakeholder interests and will build on previous studies and all available information. This public process is designed to be a consensus-building effort that provides advice on any necessary maritime safety improvements.”<sup>5</sup>

In pursuing this goal, the Panel co-chairs strove to ensure that a cooperative and inclusive approach was used to ensure that a credible risk management plan that reflected the consensus of the Panel would be developed.

### **International and Tribal Participation**

Although the MOU was signed between the State of Washington and the U.S. Department of Transportation, it was imperative that representatives from Canada participate on the Panel due to the various existing agreements between the United States and Canada, the international nature of the waterway being reviewed, and the scope of potential recommendations. The Canadian Coast Guard, responsible for marine safety operations, and Transport Canada Marine Safety, responsible for marine safety regulation and inspection, were invited. The Canadian Coast Guard accepted the representation for both agencies.

While not a part of the Panel’s deliberative process there was recognition of the States/BC Task Force and its work aimed at ensuring uniformity of policies along the west coast. In any case, the Panel acknowledged the need for both the U.S. and Canada to work closely together to ensure that the regulations of the two countries were compatible, and thus to the extent possible, afford the mariner a seamless transit through the waters of both countries.

Similar to Canada, the participation of Tribal representatives was considered an essential element of the Panel’s deliberations. Members of the Makah Nation were active, valued participants in the Panel process.

### **Presentations**

A substantial portion of the first half of the Panel sessions (September 1999-February 2000, sessions 1-12) focused on a series of technical presentations. The Panel also reviewed pertinent studies including additional presentations from various parties of interest. These studies and presentations are briefly described in the Summary Notes of the various meetings

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<sup>5</sup> See Appendix 4, p. 1, par. 1.



and all accompanying documents are on file. A summary of the presentations can be found in Appendix 7.

There were a number of presentations that reviewed completed studies. These tended to generate a great deal of discussion and/or disagreement among Panel members. There was no attempt made to reach a consensus on the meaning and significance of these reports and presentations, instead each Panel member used the information presented to shape the formulation of his or her own recommendations and concerns.

### **Scope of Work**

The Panel was charged with employing a risk-based approach to develop a comprehensive management plan on how best to manage the oil spill risk (in terms of both probability and consequence) from commercial vessels operating in or transiting through the region. As stated above, the Panel was to utilize existing studies and information, and not repeat work done previously by other groups.

The following outline taken from the Scope of Work [Appendix 6], and based upon the U.S. Secretary of Transportation's determination in November of 1998 [Appendix 10], lists the topical areas that the Panel hoped to address fully and effectively:

- Waterways Management (Collision Avoidance, Traffic Separation Scheme Improvements, Port Access Routing Study)
- Port State Control Program Improvements (Integration of State and Federal Inspection Resources, Cooperative U.S./Canadian Programs)
- Port Access Routing Study
- Human and Organizational Error Countermeasures (Fatigue Prevention, Improved Communications, Pilotage)
- Collision, Drift Grounding and Powered Grounding Prevention (Dedicated Tug, Tug Escorts, International Tug of Opportunity System (ITOS))
- Response Capabilities (Boom Deployment Capabilities, Allocation of Response Assets, Dedicated Response Vessel, Internationally Seamless)

The Scope of Work was quite expansive, the issues complex and contentious, and not all of the work items were fully addressed.

## **C. Risk Management**

### **Work Plan**

A Work Plan approach consistent with the Scope of Work was adopted by the Panel as the method for moving forward and building on Secretary Slater's focus on five broad categories of additional measures.



As part of the Work Plan approach, and given the Panel's limited time frame, the Panel adopted a risk-based evaluation process to promote an efficient, documented, and timely process. The intent was that this approach would be incorporated into any plan used to facilitate the Panel's work.

The Panel agreed that an effective oil spill risk management plan needed to ensure that appropriate intervention measures were introduced between the various stages of the error causal chain. The Panel's task was to determine whether measures were already in place, what they were, whether any significant gaps existed, and what the most effective way of filling those gaps should be in order to manage risk in the system.

Initially risk mitigation measures were addressed as either Tier I (those that lent themselves to consensus) or Tier II (more complex issues). Based on the length of time it took to reach consensus on the Tier I issues, it became apparent that a similar process would be too lengthy for the Tier II issues, and that a deviation from this process would be necessary to ensure a timely completion of the process.

Therefore, in an attempt to take an effective and efficient step forward while still abiding by the framework established in the guiding principles, the Panel adopted a change in its work approach as proposed by the facilitators-mediators. During the February meeting each Panel member was asked to develop a set of recommendations to enhance marine safety by further addressing each of the accident types and oil spill response measures. Each Panel member developed their own individual topical recommendations by focusing on their own primary interests and by using the information presented to the Panel. These proposals were in turn consolidated by the facilitators-mediators into a matrix that was sorted into the various risk categories. This set of matrices became the framework for subsequent discussions, and was the foundation for the development of the final recommendations.

### **Recommendations**

The twenty-four recommendations that appear in Section VI of this report are the culmination of much effort and discussion on the part of Panel members. The Panel discussed these proposed recommendations in detail, and a final vote was taken to determine whether a consensus had been reached. In accord with the Panel's approved procedural agreements, at a minimum, consensus minus two was required to pass a recommendation.

During the discussion of several recommendations it became apparent that the Panel either lacked the expertise, had insufficient information due to the complexity of the topic, or was unable to reach consensus due to data and/or value disputes. These topic areas and attendant discussions are captured in the Other Measures Considered, Section VII of the report.

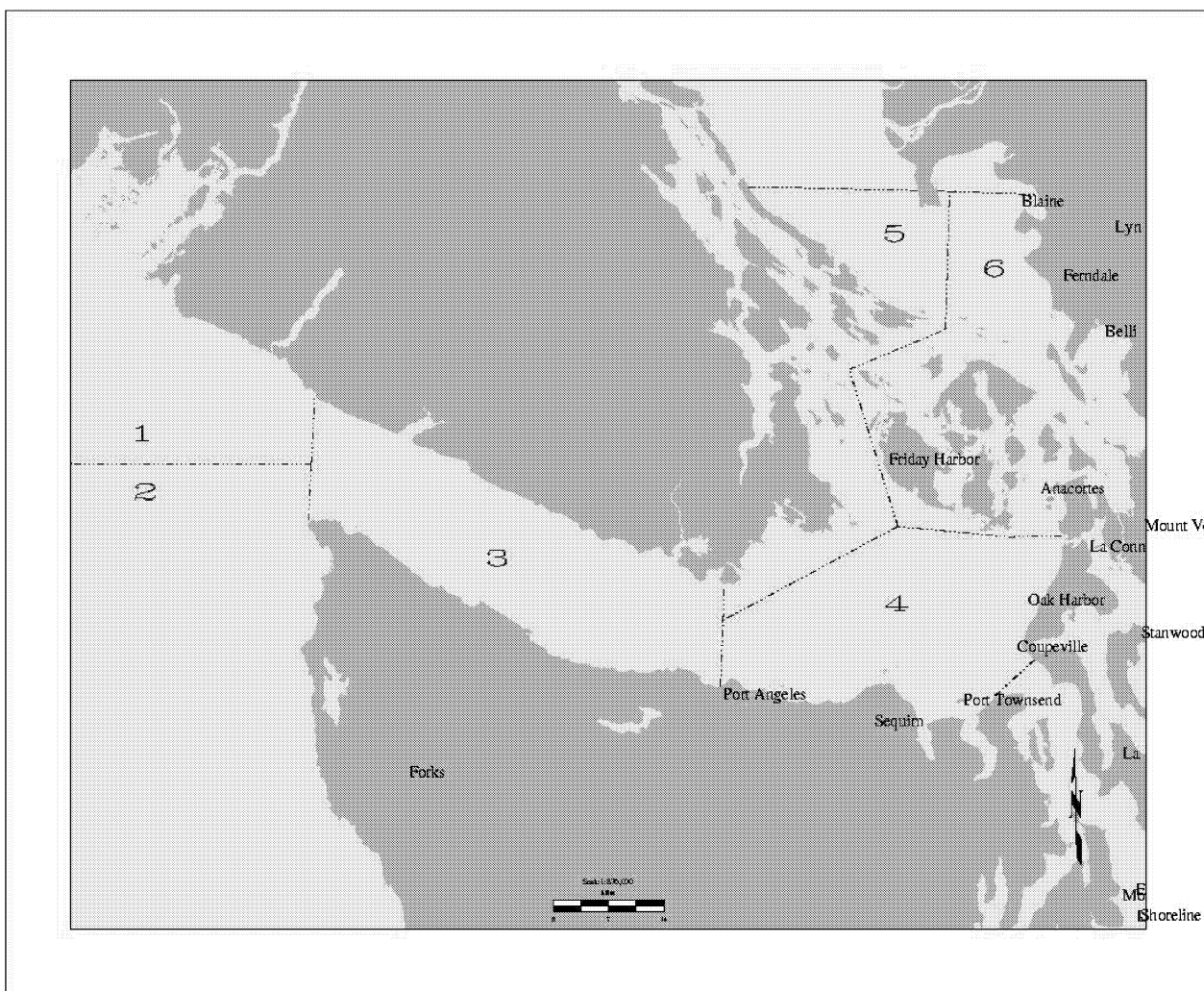


## V. Background Research and Data

### A. Waterway Description

The study area encompasses the Olympic Coast National Marine Sanctuary, the Strait of Juan de Fuca, and Puget Sound north of Admiralty Inlet. A number of studies previously completed provide a detailed description of the waterways in this area. Several of these studies are cited in the reference section. The segments used by the Panel to describe the waterway are identical to the breakdown used in the Volpe Study. A brief description of the physical characteristics and environmental sensitivities for the segments are provided below.

**The Study Area<sup>6</sup>**



<sup>6</sup> Chart provided by the Washington State Department of Ecology, Spills Program.



### **General Overview of the North Puget Sound Area**

Approximately 11,000 vessels moved through the Strait of Juan de Fuca in 1999. The federal cost-benefit study<sup>7</sup> estimated that approximately 15.1 billion gallons of crude oil, refined products and bunker fuel oil will be moved in and out through the Straits in 2000. By the year 2025 the volume is projected to increase to 19.2 billion gallons. About 7.6 billion gallons of this total volume will be crude oil imported to Puget Sound area refineries. Additional crude oil is exported from Canada's Port of Vancouver, and 2.8 billion gallons of refined products will be exported from Puget Sound.

Other indicators of the increasing importance of trade to the region's economy include:

- The Delta Port expansion just north of the international border in the Strait of Georgia, British Columbia
- The proposed Gateway Terminal near Cherry Point in Washington's Strait of Georgia
- Potential Pacific-Rim trade expansion resulting from China receiving most favored trading status

Washington Public Ports Association's 1999 Marine Cargo Forecast projects that "total waterborne tonnage through Puget Sound ports is expected to increase by 42% to nearly 121.6 million tons in 2020, compared with 85.6 million tons in 1997." The report further found that the "total container traffic through the Puget Sound ports of Seattle and Tacoma is expected to grow by 131% from 2.6 million TEUs in 1997 to 6 million TEUs in 2020." (See Washington Public Ports Association and Washington State Department of Transportation, 1999 Marine Cargo Forecast, March 1999.)

In spite of these projections, historical evidence indicates that the number of Puget Sound vessel transits has been relatively stable over the last few years. Arguments were also put forward that future trade expansion will be largely accommodated by larger state-of-the-art container ships rather than by increased transits of older, smaller cargo ships.

According to the November 1999 Federal Regulatory Assessment – Use of Tugs to Protect Against Oil Spills in the Puget Sound Area, the average size of tankers is expected to increase from 96,000 deadweight tons (DWT) to 108,000 DWT by 2025. All single hull tank ships and barges will be phased out by 2015 in compliance with U.S. federal law.

Other vessel traffic indicators pertinent to the study area are that the greater Puget Sound area constitutes the third largest naval port complex, supports one of the highest per capita recreational boat ownerships, and is home to the largest passenger/car ferry system in the nation.

The North Puget Sound waterway also supports a wide range of highly beneficial and valuable uses that are important to the area's quality of life including commercial fisheries,

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<sup>7</sup> USCG, "Regulatory Assessment - Use of Tugs to Protect Against Spills in the Puget Sound Area" (Federal Cost-Benefit Analysis on Tug), consultant report by Designers and Planners, and Herbert Engineering, 1999.



treaty fisheries, tribal subsistence shellfish harvest, salmon and shellfish aquaculture, commercial shipping, petroleum transportation, activities associated with major ports, military activities, archeological and historic sites, private property, natural resource existence values, recreational activities, and tourism.

### **Segments 1 and 2: Outer Coast and Approaches**

The entrance to the Strait of Juan de Fuca includes Duncan and Duntze Rocks and Tatoosh Island off of Cape Flattery, as well as numerous offshore sea stacks south of the cape. The remote and relatively pristine outer coasts of Washington State and the province of British Columbia contain rocky headlands, small islets, off-lying shoals and long stretches of broad beach.

The coast contains economically important fishery and wildlife resources, first nation and tribal lands, Pacific Rim and Olympic National Park, Olympic Coast National Marine Sanctuary, wildlife refuges, designated wilderness areas, and other parks.

The area is well known for unstable weather that can pose significant challenges to vessels transiting the area, especially in winter. Navigational challenges include poor visibility from rain and fog (including summer fog), strong southwesterly winter winds that create a lee shore, large waves associated with local winds, and high ocean swells generated by distant North Pacific storms.

The relative severity of conditions at the entrance to the Strait are indicated by:

- Visibility reduced to less than 0.6 mile about 55 days per year.
- Currents at the entrance can reach a maximum of 1.5 knots on the flood tide and 2.5 knots on the ebb tide.
- According to the NOAA Coast Pilot,<sup>8</sup> “from October through March, winds at the Pacific entrance to the Strait of Juan de Fuca blow mostly out of the SE through SW. Gales blow on 4 to 6 days per month.”<sup>9</sup>

The effects of the California current and wind on regional coastal currents tend to give a predominantly northwest flow in winter and a southeast flow in the summer. This current pattern would have a significant effect on the trajectory and long distance transport of a major coastal oil spill should one occur. According to values derived in the Washington State damage compensation table, the northern outer coast contains the most valuable marine natural resources in Washington State. Wildlife resources placed at risk during major oil spills include marine mammals (whales, porpoises, sea otters, seals and sea lions), marine birds, salmon and other marine fish, and the pristine environment of the National Park’s inter-tidal zone. According to the NOAA Sanctuary Environmental Impact Statement (EIS),

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<sup>8</sup> NOAA, “U.S. Coast Pilot-7, Pacific Coast: California, Oregon, Washington, Hawaii,” 1997.

<sup>9</sup> *Ibid.*, A gale is a storm where the wind speed exceeds 33 knots (39 MPH).



“the seabird colonies of Washington’s outer coast are among the largest in the continental United States.”

A coastal oil spill would disrupt cultural activities of first nation people and tribes, and clean-up efforts would damage fragile shoreline archeological sites.

### **Segments 3 and 4: Strait of Juan de Fuca**

The Strait is bounded to the west by Cape Flattery; the north by Vancouver Island and the Gulf and San Juan Islands; the south by the Olympic Peninsula; and to the east by Whidbey Island. The southern coastline of the Strait generally consists of high banks, rocky prominent features, and low sandy points and spits. The southern coast of Vancouver Island consists primarily of densely wooded gradually rising hills. The area includes substantial fishery and wildlife resources, state and provincial parks, a protected marine area, and Tribal lands.

The western Strait is approximately 10 to 15 miles wide and is generally free of offshore hazards beyond the 10-fathom depth contour. Tidal currents in the Strait generally parallel the coastline, and can exceed 2 knots. Maximum ebb in the eastern Strait is 4 knots, and current directions are more variable than the central Strait.

The Strait contains extremely valuable and environmentally sensitive habitats such as the Olympic Coast National Marine Sanctuary, Dungeness National Wildlife Refuge, Sequim and Discovery Bays in the U.S., and Race Rocks off Vancouver Island. Aquaculture is important to the area’s economy, and is very sensitive to oil spills.

### **Segments 5 and 6: San Juan Islands (Including Haro and Rosario Straits)**

This segment consists of the waters between Canada and the United States bounded on the west by Vancouver Island and on the east end by Bellingham Bay. The rocky coasts are irregular with many islands, headlands, and off-lying reefs. Haro Strait and Boundary Pass combined are approximately 37 miles of confined waters, which provide the primary passage from the Strait of Juan de Fuca to the Strait of Georgia for traffic to and from Vancouver, B.C. and other Canadian ports.

There are heavy tiderips off Discovery Island on the ebb tide. The narrowness of Haro Strait, the sharp turns at Turn Point and East Point, and strong tidal currents and winds combine to pose particular navigational challenges. Near the east end of Boundary Pass the current runs in surges on ebb tide and forms eddies. Maximum currents are 3.2 knots in Haro Strait and 3 knots in Boundary Pass. Substantial currents also occur between the San Juan Islands and in Rosario Strait.

This area includes substantial fishery and wildlife resources, state and provincial parks, Makah Tribal lands, wildlife refuges, and marine protected areas. The San Juan Islands contain valuable marine natural resources and some of the most expensive private waterfront land in Washington State.



Examples of extremely valuable and vulnerable shallow embayments include Padilla, Fidalgo and Samish Bays at the eastern boundary. These and other bays contain eelgrass beds that are nursery areas for a wide variety of species. They are also important resting and nesting areas for waterfowl on the Pacific flyway.

Some of the small more remote rocky islands contain important sea bird rookeries. The resident and transient killer whale pods that frequent the area may be particularly susceptible to the effects of spills.

Because the historical U.S. oil spill records of Haro and Rosario Straits do not include a large spill of heavy oil suddenly released (e.g., due to a collision or powered grounding), there is a concern about underestimating the probability and consequences of such an event. The high volumes of traffic going to and from Vancouver, particularly of freighters with their large volumes of bunker fuel, lack of double hull and redundant systems, combined with the narrowness of the passages, strong currents, rocky bottom and shorelines, may increase risk beyond what may be inferred from the historical record. Some of these same factors may increase the possibility that if a spill were to occur in this area it could be of large volume.

## **B. Waterway Risk**

The Panel was unable to reach consensus on what an acceptable level of safety, or conversely what an acceptable level of risk was, and therefore, was unable to define gaps in other than very general terms.

### **Volpe Report<sup>10</sup>**

To the extent possible, the Panel considered all work done to date on marine oil spill risk in the greater Puget Sound area. The Panel referenced extensively the most comprehensive work to date on marine oil spill risk in the greater Puget Sound waterway: the 1997 Volpe Report.

As a scoping document, the Volpe Report is "an initial characterization of the hazards which can cause oil spills by ships underway and the environmental sensitivity to such spills." It is "one step in a larger, iterative process in which refined methods and new data can be added and waterway safety periodically reviewed."<sup>11</sup> As the report states, "This study brings the Coast Guard and the Department of Transportation to the threshold of the risk management phase."<sup>12</sup>

The goal of the Panel was to draw conclusions about "risk" and about "gaps" in spill prevention efforts in the North Puget Sound portion of the larger area reviewed in the Volpe Report.

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<sup>10</sup> Volpe National Transportation Systems Center, "Protection Against Oil Spills in the Marine Waters of Northwest Washington State," Department of Transportation, Cambridge, July 1997.

<sup>11</sup> *Ibid.*, p. xii

<sup>12</sup> *Ibid.*, p. 4



### **Relative Risk Among Waterway Segments**

The Volpe Report assessed only the relative risk of an oil spill among segments of the entire greater Puget Sound waterway.

This relativistic approach should not mask the fact that even if certain factors suggest high risk for relatively smaller spills in central Puget Sound, that in no way diminishes the absolute risk of larger spills in the northern segments of the waterway. The Memorandum of Understanding placed the focus for the Panel on the northern segments.

The Volpe Report concludes that the “highest” oil spill risk is in central Puget Sound from Admiralty Inlet to Tacoma. Behind its hierarchical listing of relative risk (emphasized in its graphical representations), the text of the Volpe Report states that the risk is at that same “highest” level in most if not all of the northern waterway segments. Moreover, the report stresses that there is very modest variation in the level of oil spill risk in these segments.

It was also noted during Panel deliberations that segmenting the waterway introduces a certain artificial distinction between the segments. For example, the risk of oil spill consequences to the marine and shoreline environments at the entrance of the Strait of Juan de Fuca near “J” buoy is not significantly less just east of an artificial line subdividing the ocean approaches (Segments 1 and 2) from the western Strait proper (Segment 3).

### **Risk in Rosario Strait and the San Juan Islands**

The Volpe Report finds that this segment is at “highest” risk of a major oil spill with high accident likelihood, and spill consequence ratings “despite highly rated spill response capability and relatively benign conditions.” The report further states: “This suggests that shipping safety there may need re-examination, in spite of a strong regime of local safety measures.”<sup>13</sup>

### **Risk in Haro Strait**

The Volpe report states that Haro Strait “should ... be considered at roughly the [same] risk” as Rosario Strait and the San Juans, e.g. the “highest” risk.<sup>14</sup>

The Volpe authors were handicapped in their assessment of risk in this and other segments by the absence of Canadian accident data. Therefore, the report called for a re-assessment of this segment when such data is available to update the risk model, while in the meantime, urging it be considered as at “highest risk.”

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<sup>13</sup> *Ibid.*, p. 89 [There will be fewer tug escorts in these waters over the next 14 years as double-hulled tankers phase-in. The Volpe Report observes that, “While more capable vessels may arguably have less need for escort, fewer escort tugs in the waterway will have other implications. Emergency response requires the availability of tugs and/or other vessels for assistance ...” for all types of vessels. p. 95]

<sup>14</sup> *Ibid.*, p. 89



### **Risk in the Ocean Approaches**

According to the Volpe Report, "The open ocean approaches to the Strait of Juan de Fuca ... fall into the next highest risk category."

Having suggested that this area of congested and conflicting traffic coupled with severe environmental conditions is at somewhat lower risk than Rosario and Haro Straits, the Volpe authors add that "the relative probability of an accident leading to a serious oil spill may be underestimated here because physical conditions and the converging and crossing nature of the deep draft vessel traffic are indicators of such low probability events."<sup>15</sup>

### **Risk in the Western Strait of Juan de Fuca**

The Volpe Report states that the western Strait has an "average" overall risk rating.

The waters of the western Strait of Juan de Fuca and the open ocean approaches are subdivided into three separate segments. The Volpe Report does not account for an oil spill in one segment spreading into an adjacent segment. The Report does note that its expert panel gave its highest accident risk rating in the entire greater Puget Sound waterway to the Southern ocean approach.<sup>16</sup> A 1995 Canadian risk assessment found the entrance of the Strait of Juan de Fuca is the most likely place for a spill.<sup>17</sup>

### **Incomplete Accident Data**

The U.S. and Canadian Coast Guards should devote higher priority to sharing and reconciling this fundamentally important data, lack of which seriously impairs fundamentally important risk assessment to characterize accident and oil spill risks in the waterway.

### **Secretary of Transportation's Determination**

In a Federal Register notice published on November 24, 1998 [Appendix 10] the U.S. Secretary of Transportation stated:

"Based on the findings in the Volpe Center's report, I hereby determine that the many existing elements of the region's marine transportation system comprise a safe system. While there are always areas for improvement—and we should always be looking into means for improving safety—the Volpe report shows that the Puget Sound area has an excellent system now."

The secretary added:

"Based on the findings in the Volpe Center's report—and upon consideration of input received through public workshops and a public meeting we held subsequent to the release of the Volpe Center's report—I hereby find that the

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<sup>15</sup> *Ibid.*, The Volpe authors note that the geographic distribution of major vessel oil spills reported by DOE is noteworthy for its concentration in this area.

<sup>16</sup> *Ibid.*, p. 89, Table 6-1

<sup>17</sup> *Ibid.*, p. 67



potential for collisions, power groundings, and drift groundings warrant consideration of specific additional measures to further mitigate their risks.”

## C. Incident History

### General Overview of the North Puget Sound Area

Historically, spills over 10,000 gallons have generated over 90% of the total volume of spilled oil, which was the result of vessel groundings, collisions, and allisions. There has been a marked reduction in both the number of spills and the volume of oil spilled since 1990 as a result of heightened industry awareness following the Exxon Valdez spill, an expanded regulatory framework, and increased oversight by the state of Washington and U.S. Coast Guard.

The Washington Department of Ecology presented the Panel with an evaluation of incident and spill data that has been analyzed over a five-year period [Appendix 14]. Similarly, the U.S. Coast Guard presented some of its incident and spill data [Appendix 15], but clearly indicated that more could be done to enhance the ability to manipulate the data as an effective risk characterization tool. These presentations generated valuable discussions among the Panel, and helped some members frame their perspective on “acceptable risk” and potential “gaps” in the safety system.

Although agreement could not be reached on quantifiable conclusions relative to this data, several general observations were made. Incidents that could lead to a vessel drift grounding tend to occur at points where vessels conduct propulsion shifts or change fuels. Plus the risk of collision is heightened in those areas where congestion exists or where vessel crossing situations may occur.

### Segments 1 and 2: Outer Coast and Approaches

The area west of the entrance of the Strait of Juan de Fuca has a relatively high incidence of propulsion loss [Appendix 14].

The outer coast is the area where some of the largest oil spills in Washington State have occurred (see: *Oil Spills in Washington State – A Historical Analysis*.<sup>18</sup>). The most significant coastal spills off the Washington coast during the last 20 years include:

- The 1988 collision between the ocean-towing tug *Ocean Service* and the tank barge it was towing, the *Nestucca*, following a tow wire break in heavy seas. The *Nestucca* released 231,000 gallons of heavy fuel oil north of the entrance to Grays Harbor.
- The 1991 collision of the *Tuo Hai* grain carrier with the *Tenyo Maru* fish-processing vessel. The *Tenyo Maru* sank with over 400,000 gallons of oil onboard and the loss of one crewmember.

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<sup>18</sup> Department of Ecology, “Oil Spills in Washington State: A Historical Analysis,” Washington State Department of Ecology, Olympia, WA, 1997.



Of special interest to the Makah Tribe is the oil spill from the Navy vessel *General M.C. Meiggs*. The drift grounding casualty occurred just south of Cape Flattery in 1972 when the wire snapped that was towing the *Meiggs*. The vessel grounded and broke in half on the rocky coast. According to NOAA records, 2.3 million gallons of heavy fuel oil was released. This was the largest recorded oil spill in Washington history exceeding the United Transportation barge 1.2 million gallon coastal oil spill that occurred in 1964.

### **Segments 3 and 4: Strait of Juan de Fuca**

Incident data indicates that there is a risk from drift groundings in the vicinity of the Port Angeles Pilot Station where vessels are slowing down in preparation for taking on a pilot.

- The most significant spill in the Straits during the last 20 years was the 1985 *Arco Anchorage* tank ship that resulted in a 239,000 gallon crude oil spill. The spill occurred while the vessel was anchoring, and has been classified as a powered grounding.

### **Segments 5 and 6: San Juan Islands (Including Haro and Rosario Straits)**

A powered grounding is more likely to occur in the restricted waters of Haro and Rosario Straits than in the more open regions of Puget Sound.

The 2 most significant spills during the last 20 years in these segments include:

- The 1988 over loading, foundering and subsequent sinking of the tank barge *MCN 5* releasing 70,000 gallons of heavy oil into Rosario Strait near Shannon Point.
- The 1994 powered grounding of the tank barge *No. 101* releasing 27,000 gallons of diesel fuel in the Rosario Strait area.

## **D. Marine Transportation System Safety**

The current marine safety and environmental protection system can be described as a multi-layered safety net. Each level of this net, like interventions in the error causal chain, may be responsible for preventing the undesired outcome of a marine accident. The entities that make up this safety net include the ship's crew, the vessel operator and their management team/system, the classification society and their inspectors, the flag state and associated inspection regime, the port state with attendant inspection system, and, in Washington, the state inspection system. In addition to the layers listed above, an active system of waterways management is in place that further mitigates risk.

This report does not capture in detail the role of each of these entities, but it is important to recognize that each has a role in the safe operation of a ship sailing the waters of the study area. In general terms, it is incumbent upon the ship's crew to be trained to perform their jobs in a professional manner. The vessel operator must support the crew through well-reasoned maintenance and operational programs. The classification society must be vigilant in their role, and government inspection programs must be accurate, appropriate and effective to avert safety deficiencies from becoming accidents.



## Regulatory Regime

The regulatory safety regime is comprised of several layers of regulations or standards at the international, national, state and local levels. To varying degrees, the rules covering commercial vessel safety and marine environmental protection pertain to all vessel traffic throughout the study region. The brief synopsis of the regulatory regime presented below is not intended to be inclusive. Rather the goal is to provide a sense of the scope of rules imposed upon commercial vessels. Also, it is important to note that the level of regulatory imposition varies considerably by vessel type. Generally speaking, the level of regulation imposed is linked to the level of risk associated with the particular vessel's operations with the objective of ensuring the risk is reduced.

The U.S. Supreme Court upheld federal supremacy in many aspects of tank vessel regulatory jurisdiction in its decision on the *INTERTANKO vs. Locke*<sup>19</sup> (Washington State) lawsuit. However, the Court confirmed the validity of state regulations in the areas of spill response, financial responsibility, and spill prevention measures related to waterway peculiarities.

## International

By international agreement, the International Maritime Organization (IMO) establishes regulations that govern vessels of signatory nations while they are outside the waters of their own nation. These regulations cover a wide array of topics, and heavily influence the overall level of safety achieved. International regulations that apply to vessel safety and pollution prevention in the study area include:

- a) International Convention For The Safety Of Life At Sea (SOLAS), 1974
- b) International Load Line Convention (ICLL), 1966
- c) International Convention For The Prevention Of Pollution From Ships, 1973 As Modified By The Protocol Of 1978 (MARPOL 73/78), Annexes I-V
- d) International Regulations for Preventing Collisions At Sea, 1972 (COLREGS)
- e) International Convention Relating To Intervention On The High Seas In Cases Of Oil Pollution Casualties, 1969
- f) Convention On The Prevention Of Marine Pollution By Dumping Of Wastes And Other Matter, 1972, "London Dumping Convention"
- g) International Convention on Standards of Training Certification and Watchkeeping, 1978 (STCW)
- h) International Labor Organization Convention No. 147, The Convention Concerning Minimum Standards in Merchant Ships (ILO 147)
- i) International Safe Management Code (ISM)

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<sup>19</sup> International Association of Independent Tanker Owners (INTERTANKO) vs. Gary Locke, Governor of Washington; Supreme Court of the United States; 98-1706, March 6, 2000.



- j) International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC)

This list is by no means comprehensive, but it reflects the majority of substantial regulations currently in place at the international level. Enforcement of these regulations is the responsibility of those nations who are signatories to the conventions.

### **United States**

The U.S. Coast Guard is the marine safety and regulatory enforcement agency of the federal government, and is charged with implementing and enforcing both international and national regulations. Significant relevant federal statutes include:

- a) Oil Pollution Act of 1990 (OPA 90)
- b) Clean Water Act of 1977 (CWA)
- c) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986
- d) Deep Water Port Act
- e) Hazardous Material Transportation Act (HMTA)
- f) Hazardous Materials Transportation Uniform Safety Act (HMTUSA)
- g) Marine Protection, Research and Sanctuaries Act of 1972
- h) Ports and Waterways Safety Act (PWSA) as amended by the Port and Tanker Safety Act of 1978
- i) Rivers and Harbors Act of 1899

While the above list is not intended to be inclusive, this body of laws establishes the Coast Guard's authority over vessels operating in U.S. waters. The U.S. Coast Guard implements these mandates by adopting rules codified in the Code of Federal Regulations (CFR). The most significant regulations that apply to vessel standards and safety as well as oil spill planning, prevention and response can be found in Titles 33, 46 and 49 of the CFR.

### **Canada**

The responsibility for marine safety in Canada resides with two agencies, Transport Canada Marine Safety and the Canadian Coast Guard. Transport Canada Marine Safety is primarily responsible for incident prevention that includes vessel risk screening and inspections. Transport Canada utilizes the Paris MOU, Tokyo MOU as well as the Canada Shipping Act for guidance and authority to conduct inspections of vessels. They also utilize the extensive set of international standards listed above.

The Canadian Coast Guard is the primary agency that oversees their vessel traffic management issues. Their traffic management is carried out by the Marine Communications and Traffic Services branch, which are full participants under the Cooperative Vessel Traffic



Services Agreement (CVTS). The Canadian Coast Guard is the lead agency responsible for the overseeing all pollution response incidents including oil spills.

### **State of Washington**

Washington State is an active participant in regulating the maritime industry and responding to marine pollution incidents.

Significant relevant state statutes include:

- a) Oil and Hazardous Substance Spill Prevention and Response – RCW 90.56
- b) Vessel Oil Spill Prevention and Response – RCW 88.46
- c) Transportation of Petroleum Products – Financial Responsibility – RCW 88.40
- d) Pilotage Act – RCW 88.16
- e) Water Pollution Control – RCW 90.48
- f) Hazardous Waste Cleanup – Model Toxics Control Act – RCW 70.105D

The Department of Ecology is Washington State’s lead agency for oil spill prevention and response. In response to its statutory mandate, the Department of Ecology adopted regulations and developed programs that augment similar programs established at the federal level. Both the state and federal programs emphasize environmental protection, but with the state having more of a local focus.

### **Waterways Management**

Waterways management is a term used to describe a broad range of activities carried out by the U.S. Coast Guard and other organizations within the study area. Activities include vessel traffic management and pilotage as well as many activities conducted under the broad authorities of the Captain of the Port (COTP).

The Cooperative Vessel Traffic Service (CVTS) operated by the Canadian and U.S. Coast Guard is a key element of waterways management. The system provides coverage for predictable and safe movement of vessel traffic from outside the western entrance, through the Strait of Juan de Fuca, including Haro, Rosario and Georgia Straits, as well as the lower Puget Sound. The CVTS manages deep-draft vessel traffic as well as barges, passenger vessels and fishing vessels. Tofino Traffic recorded that VTS traffic volumes approach 15,875 vessel movements annually at the entrance to the Strait of Juan de Fuca.

In addition to active management there are several vessel routing mechanisms in place. These include the Area-to-be-Avoided (ATBA) off the west coast of Washington as well as the Traffic Separation Scheme. This system has been adopted by the International Maritime Organization (IMO), and applies to vessels operating in both U.S. and Canadian waters. There is also a Tanker Safety Area within a 2-mile arc centered on Turn Point Light (Haro Strait). Loaded tankers of 40,000 DWT or greater are required to make passing



arrangements, where possible, prior to meeting, overtaking, or crossing ahead of any other vessels transiting this area.

In addition to the vessel traffic system, pilotage is compulsory for most vessels inland of Victoria and east of Port Angeles in U.S. and Canadian waters. The boarding stations for the pilots are off of Victoria Harbor for Canadian pilots and off of Port Angeles for U.S. pilots. Additionally, while in U.S. waters, single-hull, laden oil tankers are required to have a 2-tug escort east of Dungeness Spit.

The Captain of the Port exercises authority in a broad array of circumstances to ensure that port and waterway safety is maintained. The COTP can direct vessels to take specific actions through the issuance of a COTP order. Vessels can be detained from leaving port or denied entry if they fail to comply with applicable regulations and international standards. The broad authorities given to the COTP by the Ports and Waterways Safety Act can be used in support of the development of Standards of Care as a non-regulatory means of improving marine safety.

When this broad array of regulatory and management layers are brought to bear on vessels there is a substantial safety net in place. While this array provides a high level of safety, there is always room for, and a desire to implement, appropriate improvements that reduce the potential for accidents to occur.

## **E. Spill Response and Salvage**

Response capabilities differ between the segments in the study area. Rapid deployment and good weather conditions are crucial for successful recovery of oil from any spill.

Deployment of spill response equipment is complicated by the remoteness of many areas particularly the outer coast and western Strait of Juan de Fuca. In addition to remoteness, harsh weather and sea conditions can also complicate oil recovery efforts and reduce recovery rates.

The Panel initially set out to conduct a comprehensive review of the adequacy of spill response capabilities within the study area. However, given the complexity of the topic, the limited time available, and the existence of other forums such as the Northwest Area Committee, spill response was discussed only in general terms. There were several general recommendations developed as a result of these discussions.

The Panel also had brief discussions regarding the need for improved coastal salvage capability. The federal On-Scene-Coordinator's report on the *New Carissa* oil spill in Oregon found that that salvage capability was lacking nationally and specifically during the *New Carissa* event.



## F. Presentations

The first several Panel sessions were spent presenting complex background data and general information to Panel members. See Appendix 7 for a list of these presentations.

Additionally, various Panel members distributed a great deal of material, those handouts are listed in Appendix 8. There were several presentations that addressed completed studies or topical areas that generated a great deal of discussion and disagreement. There was no attempt to reach consensus on the conclusions put forward during these presentations, nor can this report be regarded as a validation of these studies. Information was presented and discussed in a direct manner that allowed Panel members to evaluate, weigh, and use the information as deemed to be appropriate and effective.

The following summarizes some of the concerns over gaps, weaknesses, or assumptions regarding the ITOS Evaluation and the Regulatory Assessment—two studies that provoked much Panel discussion.

### **ITOS Evaluation<sup>20</sup>**

During the fall of 1999 the U.S. Coast Guard conducted an evaluation of the International Tug of Opportunity System (ITOS). The study was designed to reduce uncertainty over what percentage of the time an ITOS transponder equipped tug was within the same waterway segment as a vessel, such that it could render assistance if that vessel experienced difficulties. The study made no attempt to evaluate the adequacy of tug horsepower, crew capability or hook-up capabilities.

The Panel agreed that the ITOS system does provide an incremental improvement in safety, and the ITOS evaluation provides valuable information to decision-makers.

### **Federal Regulatory Assessment (Cost-Benefit Analysis)<sup>21</sup>**

The Regulatory Assessment was a federal commissioned report designed to conduct a cost-benefit analysis of the ITOS system, a dedicated rescue tug, and extended tanker tug escorts. This analysis investigated several options of the cost to benefit ratio of a dedicated rescue tug and extended single or double tug tanker escorts. The report was generally well received by the Panel with the following exceptions:

- The cost-benefit analysis was conducted in accord with the guidelines required for federal cost-benefit reports utilizing the ratio of cost to barrel of oil not spilled. The “barrel of oil not spilled” is the source of a great deal of disagreement from various Panel members who are disappointed that the study’s guidelines prevented assessing a monetary value attached to the damage and loss to the environment, private property, businesses, as well as recreation, tourism, cultural values, the quality of life, and the area’s image as a whole. In an effort to bring additional insight to the Panel on the economic benefits accrued by

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<sup>20</sup> Analysis of the Geographic Coverage Provided by the International Tug of Opportunity System From November 1998 - May 1999, Commandant (G-MSE-1) U.S. Coast Guard, August 30, 1999.

<sup>21</sup> USCG, “Regulatory Assessment - Use of Tugs to Protect Against Spills in the Puget Sound Area” (Federal Cost-Benefit Analysis on Tug), consultant report by Designers and Planners, and Herbert Engineering, 1999.



spill prevention, the Department of Ecology commissioned DF Dickens Associates Ltd. to complete a brief report entitled “Oil Spill Consequences: Costs of Selected Spills” [Appendix 13].

- Some Panel members criticized the report and felt that the data on probability of spills was inaccurate and misleading. Some members felt that it may have “exaggerated,” while others believe that it may have “underestimated” the probability of major spills.



## VI. Recommendations

### A. Intervention Summary

There was no attempt made to prioritize these recommendations. However, in keeping with the basic tenants of risk management, the recommendations were loosely ordered in accordance with the sequence as they would interrupt the error causal chain, as shown below.

**Stage 1** — Basic/Root

**Stage 2** — Immediate

**Stage 3** — Incident

**Stage 4** — Accident

**Stage 5** — Immediate Consequence

**Stage 6** — Delayed Consequence

RECOMMENDATION		Point of intervention prior to stage:					
		1	2	3	4	5	6
1	Near Miss Reporting System	●	●	●			
2	State Regulatory Baseline Analysis	●	●	●	●		
3	Adequacy of Current Regulatory Baseline	●	●	●	●		
4	Standard of Care (SOC)-General	●	●	●	●		
5	SOC-Bridge Team Communications	●	●	●	●		
6	Review of Comparability Analysis	●	●	●	●	●	●
7	Effective Communications w/ Local Marine Resource Committees	●	●	●	●	●	●
8	Improve Scope and Effectiveness of Inspection Programs		●	●			
9	Education Program for Small Vessel Operators		●	●			
10	Expansion of CVTS Participation Requirements		●	●			
11	Trans-Boundary Process for Marine Safety Issues		●	●	●		
12	Towing Vessel Standards		●	●	●		
13	SOC-Steering Gear Testing		●	●	●		
14	SOC-Offshore Routing		●	●	●		
15	SOC-Planned Maintenance		●	●	●		
16	SOC-Firefighting		●	●	●		
17	Partnership with Tribal Nations		●	●	●	●	●
18	Support States/BC Oil Spill Task Force			●	●		
19	Support for PARS			●	●		
20	Implementation of UAIS			●	●		
21	SOC-Anchors			●	●	●	
22	ATBA-Applicability, Size, Compliance				●	●	
23	SOC-Vessel Towing Arrangements				●	●	●
24	Response-Area Committee Action Items					●	●



## B. Recommendation Matrix

The following matrix summarizes the accident types, accident causes, and areas of geographic coverage for each recommendation.

Recommendation	Accident Type					Accident Cause					Geographic Coverage					
	Collision	Drift Grounding	Powered Grounding	Structural Failure	Fire	Human/Organizational Error	Conflicting Operations	Physical Environment	Vessel Control	Positional Information	1 – North Approach	2 – West Approach	3 – Strait of Juan de Fuca	4 – PA to Admiralty Inlet	5 – PA to Victoria/Haro	6 – San Juan Is/Rosario
1	●	●	●			●	●	●	●		●	●	●	●	●	●
2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
4	●	●	●	●	●	●	●		●		●	●	●	●	●	●
5	●		●						●					●	●	●
6	●	●	●	●	●	●			●	●			●		●	●
7								●			●	●	●	●	●	●
8	●	●	●	●	●	●	●				●	●	●	●	●	●
9	●					●	●				●	●	●	●	●	●
10	●					●	●				●	●	●	●	●	●
11											●	●	●	●	●	●
12	●	●	●			●	●		●		●	●	●	●	●	●
13	●	●	●	●		●			●		●	●	●	●	●	●
14	●	●				●	●					●				
15	●	●				●	●	●	●		●	●				
16				●	●	●					●	●	●	●	●	●
17											●	●	●			
18	●	●					●		●		●	●				
19	●	●	●			●	●			●	●	●	●	●	●	●
20	●						●			●	●	●	●	●	●	●
21		●				●		●	●				●	●	●	●
22		●		●				●	●	●	●	●				
23		●		●		●			●		●	●	●	●	●	●
24											●	●	●	●	●	●



## Recommendation No. 1 – Near Miss Reporting System

**Action:** The Panel strongly supports the concept of a “near-miss” marine reporting system. The U.S. government should enact legislation that allows the establishment of a credible, comprehensive and publicly available international “near-miss” marine reporting system, inclusive of liability and anonymity protections together with adequate funding for program start-up and maintenance. Additionally the U.S. government should actively seek the participation of the Canadian government to ensure the efficacy of this system.

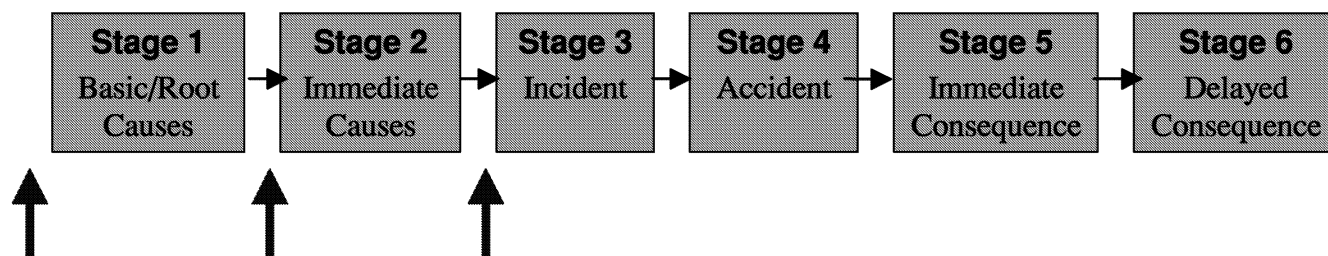
### Accident Type

### Accident Cause

### Geographic Coverage

Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Numerous databases exist which collect a wide variety of information on the marine transportation system, however, information regarding “near-miss” incidents is lacking in these databases. Collection of “near-miss” information expands these databases and improves the comprehensiveness of information available for making risk-based decisions. Collection of “near-miss” data is seen as the best way to identify both recurring events which are precursors to actual accidents, as well as root causes. The data will assist in identification of problems early in the causal chain and will assist in the development of initiatives that identify root causes and help to prevent accidents from occurring.

The U.S. Coast Guard is in the process of developing a “near-miss” marine reporting system called the International Maritime Information Safety System (IMISS). Coordination concerning the prototype testing of this system is currently on going between the U.S. Coast



Guard, the Maritime Administration (MARAD) and National Aeronautics and Space Administration (NASA).

Concurrently, the U.S. Coast Guard is seeking congressional support for legislation to establish and operate this system on a national basis. Key provisions of this legislation would be anonymity protections, appropriate relief from legal liability to those who report and funding support. These provisions are key to the success of the reporting system as evidenced by the model developed and being used by the aviation industry.



## Recommendation No. 2 – State Regulatory Baseline Analysis

**Action:** In accordance with the U.S. Supreme Court's interpretation of the states' role pursuant to OPA-90, the executive and legislative branches of the State of Washington should evaluate existing programs and policies to determine whether they need improvement regarding:

- a) imposition of liability or other spill response requirements related to discharge or substantial threat of discharge of oil; and
- b) the application of state regulations to ports and waterways based on peculiarities of Washington's local waters, local circumstances such as depth and narrowness of a channel, severe or impairing weather conditions, environmental sensitivities, or other idiosyncratic features.

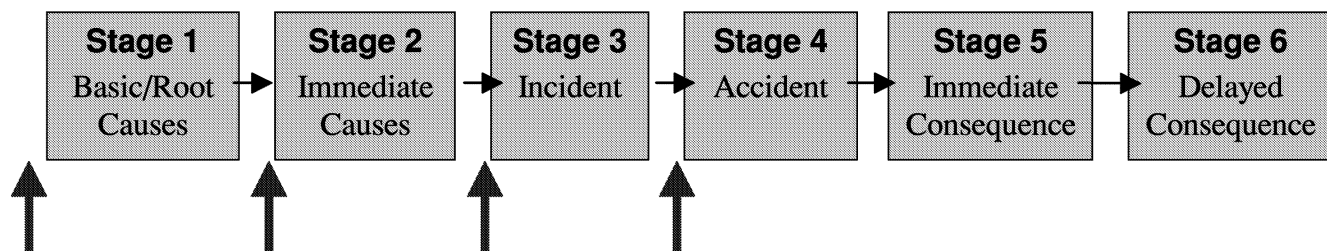
### Accident Type

### Accident Cause

### Geographic Coverage

Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Oil spill prevention and response is a partnership between the federal and state governments that is recognized by the federal Clean Water Act, OPA 90, and other federal laws. OPA 90 specifically preserves the authority of the states to impose additional liability or requirements with respect to the discharge of oil or other pollution by oil, or with respect to any removal activities in connection with such a discharge (OPA section 1018(a)(1)).



The U.S. Supreme Court in the INTERTANKO Decision specifically stated the following about the role of states:

- a) "We have upheld state laws imposing liability for pollution caused by oil spills. See *Askew vs. American Waterways Operators, Inc.*, 411 U.S., at 325. Our view of OPA's savings clauses preserves this important role for the States, which is unchallenged here." (citing *U.S. vs. Locke*, et al)
- b) "Useful inquiries include whether the rule is justified by conditions unique to a particular port or waterway. See *id.*, at 175 (a Title I regulation is one "based on water depth in Puget Sound or on other local peculiarities"). Furthermore, a regulation within the State's residual powers will often be of limited extraterritorial effect, not requiring the tanker to modify its primary conduct outside the specific body of water purported to justify the local rule. Limited extraterritorial effect explains why Ray upheld a state rule requiring a tug escort for certain vessels, *id.*, at 171, and why state rules requiring a registered vessel (i.e., one involved in foreign trade) to take on a local pilot have historically been allowed, *id.*, at 159-160. Local rules not pre-empted under Title II of the PWSA pose a minimal risk of innocent noncompliance, do not affect vessel operations outside the jurisdiction, do not require adjustment of systemic aspects of the vessel, and do not impose a substantial burden on the vessel's operation within the local jurisdiction itself." (citing *U.S. vs. Locke*, et al)

Both of these areas of policy are significant contributors to incentives for safe operation and practices conducive to safe operation. The State of Washington should implement its role as responsibly as possible. Current policies regarding these matters were put in place some years ago, and should be reviewed for their adequacy in view of changing times and new circumstances resulting from the INTERTANKO Decision.

(The Supreme Court's decision refers to *U.S. vs. Locke* (98-1701) and *INTERTANKO vs. Locke* (98-1706))



### Recommendation No. 3 – Adequacy of Current Regulatory Baseline

**Action:** The level of marine safety provided by the existing multi-jurisdictional regulatory regime has been brought into question in the wake of the Supreme Court's INTERTANKO decision.<sup>22</sup> In order to ensure that marine safety regulations provide an adequate level of environmental protection the federal government in consultation with the State of Washington should take appropriate measures to;

- a) review the existing marine safety regime and identify any gaps in safety (regulatory and/or enforceability);
- b) ensure that pre-Supreme Court decision baseline protection levels are, at a minimum maintained; and
- c) ensure regulations are enforced through maintenance of, or increases in, federal/state inspection forces.

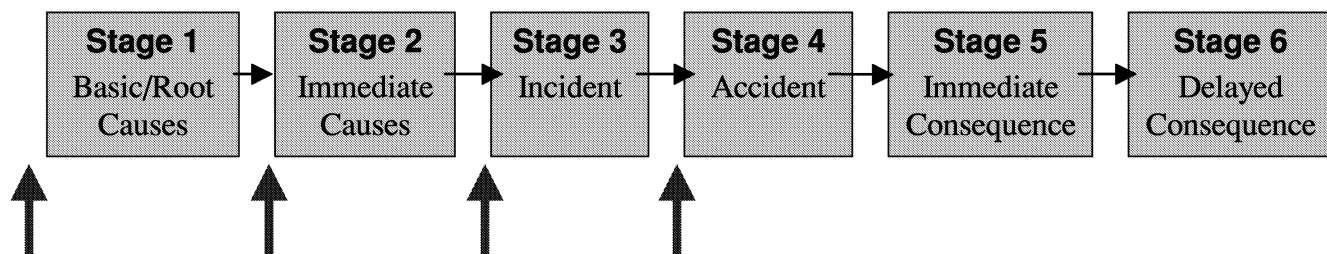
#### Accident Type

#### Accident Cause

#### Geographic Coverage

Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

#### Accident Causal Chain and Points of Intervention



**Rationale:** The marine safety regime that exists in the study area includes regulations and policies established and enforced at the local, state, national and international levels. These

<sup>22</sup> International Association of Independent Tanker Owners, INTERTANKO vs. Gary Locke, Governor of Washington; Supreme Court of the United States; 98-1706, March 6, 2000.



regulations, taken in total, form a complex and intertwined safety net that works in concert to prevent accidents and mitigate risk. The recent Supreme Court decision regarding the INTERTANKO suit changed the role of the Washington State regulations in this system and brings into question the status of the post-decisional baseline level of safety.

While an agreement has not been reached on the degree, if any, to which this regulatory “gap” exists there is full agreement that any degradation of the regulatory baseline resulting from the Supreme Court’s INTERTANKO decision is unacceptable.

A comprehensive comparison of Washington State regulations and the national/international regulations must be done to identify areas where there may have been gaps created in the regulatory “safety net” as a result of the Supreme Court’s INTERTANKO decision. In turn, any level of safety provided by measures lost as a result of the court’s decision should be replaced with protective measures pursued through the regulatory process at the federal or international level.

Regardless of the nature of the regulatory gap, the ability to enforce the standards in place, must, at a minimum, be maintained to ensure compliance. Whether the regulations are established and enforced at the state or federal level, an adequate inspection force is necessary. The comments in the rationale section of Recommendation No. 8 regarding an adequate inspection force apply in this instance as well.

The regulatory system established by the Canadian government is unaffected by the Supreme Court decision and any potential disparity between Canadian and U.S. marine safety regulations is addressed in Recommendation No. 6.

Until identification of any regulatory gap is complete it is not possible to identify which accident types or causes will be affected or where along the causal chain an intervention will occur.



## Recommendation No. 4 – Standard of Care (SOC)-General

**Action:** The U.S. Coast Guard Captain of the Port should continue to work with the Washington Department of Ecology, Transport Canada Marine Safety, maritime industry, Puget Sound Marine Committee and appropriate stakeholders to develop and implement additional Standards of Care as expeditious and appropriate supplements to regulatory requirements to promote and further enhance safety in commercial maritime operations in a timely manner.

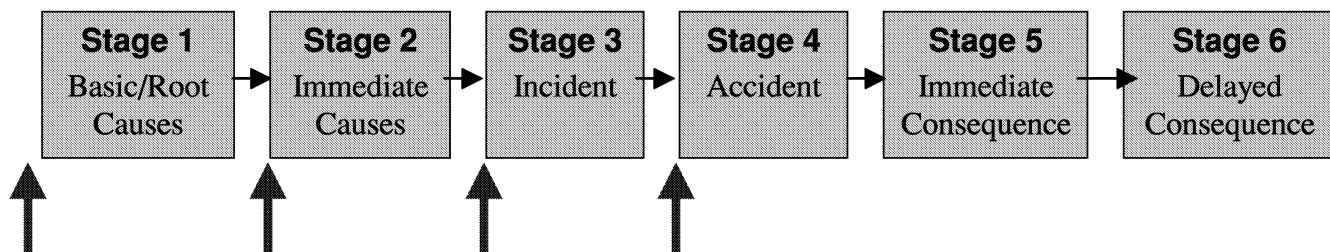
### Accident Type

### Accident Cause

### Geographic Coverage

Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Standards can be written to address/mitigate any of the accident types or causes, but with an emphasis on intervening early in the causal chain. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

Standards of Care (SOC) are developed by the Captain of the Port and while non-regulatory in nature, have the full backing of the broad authorities of the COTP found in the Ports and Waterways Safety Act. These SOC typically add specificity to the more general regulatory



standard and are developed with input from appropriate stakeholders. They are disseminated to the industry in a variety of ways including; agents, pilots, vessel operators, professional organizations, web sites, direct mail, as well as presentations to industry. Once put into place a SOC represents a prescriptive set of actions which represent good marine practice. Failure of a vessel's crew to abide by these steps may result in actions being taken by the COTP to ensure that all appropriate risk mitigation measures are in place. Depending on the circumstance and the timing of notification these steps may include, denial of entry, boarding, detention, tug escort, and or pursuit of a violation case.

Standards of Care have proven effective in providing consistent guidance to vessel operators, and have been used by Coast Guard Captains of the Port and Harbor Safety Committees to successfully address risk in their ports. Some Standards of Care have been initiated in Puget Sound over the last year, but opportunities exist for further appropriate use of this tool. Recommendations 7, 12, 16 and 21-24 are made to highlight those opportunities the Panel wishes to emphasize.



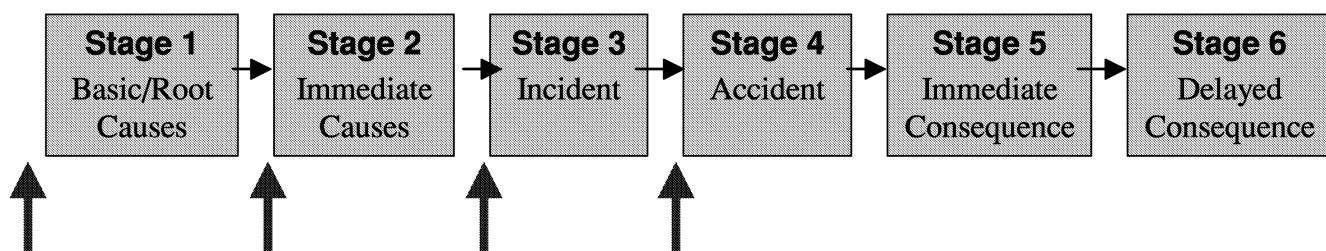
## Recommendation No. 5 – SOC-Bridge Team Communications

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety, and appropriate stakeholders, should establish and implement a Standard of Care that addresses expectations for effective bridge team communications. At a minimum, this bridge team communication standard should require a vessel master to:

- a) immediately notify the local pilot whenever maneuverability of the vessel has been adversely affected; and
- b) identify to the pilot onboard, any bridge team member who is not proficient in English.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

Effective bridge communications are not just an issue of English proficiency. Rather successful communications involve both the transmission and reception of information pertinent to the safe navigation of the vessel. Communications whether ship-to-ship, ship-to-



shore, or among a bridge team, are essential to the safe navigation of a vessel, especially through narrow channels and congested waterways.

STCW 95 requires each officer in charge of a navigational watch to maintain English proficiency necessary to perform navigational duties including communication with other ships and coast stations. It also requires the ability to perform duties with a multi-lingual crew including use and understanding of the Standard Marine Navigational Vocabulary. STCW does not, however, require all on-bridge communications to be in English. Such communication can be problematic when local experts are brought aboard to pilot a vessel with a foreign crew if some crew members on the bridge are not proficient in English.

The incident that occurred in New Orleans, LA with the M/V *Brightfield* is an illustration of how a failure by the crew to effectively communicate information regarding a condition that adversely affected the maneuverability of the vessel to the pilot can result in a significant accident. In the *Brightfield* incident the crew was aware of mechanical problems with the vessel but failed to communicate this to the pilot. This allowed the causal chain to proceed uninterrupted and a major allision occurred as a result.

Pilots must be able to communicate effectively with the vessel's bridge team, and must be continuously informed of the maneuvering capability of the vessel. Bridge team communications can quickly be addressed by adopting a Standard of Care aimed at interrupting the causal chain prior to the accident.

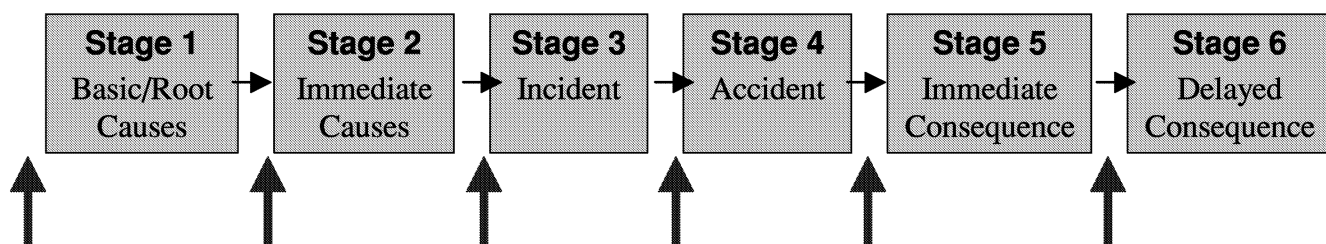


## Recommendation No. 6 – Review of Comparability Analysis

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety and the Canadian Coast Guard, should initiate a thorough review and update of the “Marine Safety and Marine Environmental Protection Comparability Analysis” completed in 1994. Every effort should be made to gain public participation while working through existing channels such as the Joint Coordinating Group (JCG). This process should address regulatory differences pertaining to commercial shipping, and ensure that a uniform marine safety regime achieving the highest common standard is applied to all commercial vessels operating in the internationally shared waters between the United States and Canada in the study area.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** The nature of the shared boundary between the U.S. and Canada make it imperative that the two nations maintain parity in their respective safety regimes for deep draft commercial vessels. Failure to strive for comparable safety standards could result in the lesser standards (lowest common denominator) influencing the level of safety in the shared waters.

In 1994, the U.S. Coast Guard and Canadian Coast Guard completed a Marine Safety and Marine environmental Protection Comparability Analysis. The purpose of the analysis was to determine if there exists a comparable degree of marine safety and marine environmental



protection between the two nations. Both Coast Guards' concluded in the analysis that broad overall comparability existed.

Six years have elapsed since this comprehensive overview was completed and both nations have continued to update and modify their respective regulations during this time. A review of the current level of comparability is necessary to identify any areas where comparability may no longer exist.

The causal chain may be broken at any point depending upon where, if any, lesser regulatory standard is identified.

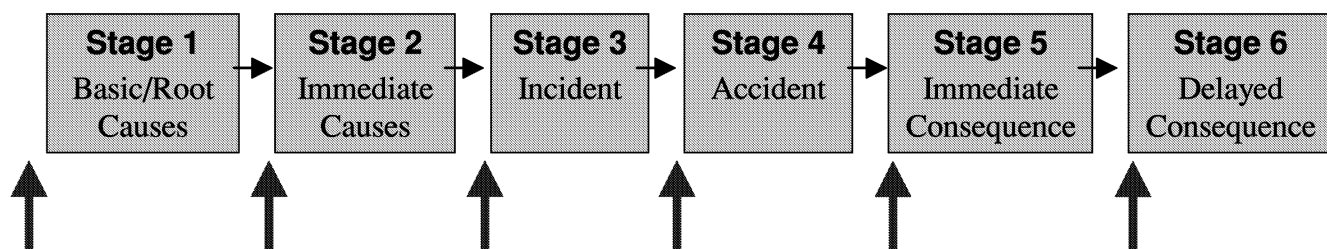


## Recommendation No. 7 – Effective Communications with Local Marine Resource Committees

**Action:** The U.S. Coast Guard and Washington Department of Ecology should ensure that effective communication links with both the Northwest Strait Commission and established local Marine Resource Committees are in place.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Local Marine Resource Committees (MRC's) have recently been established under the auspices of the Northwest Strait Commission and are designed to focus on the unique nature and needs of each county's near-shore marine resources. They have been established in Clallam County, Jefferson County, San Juan County, Islands County, Whatcom County, Skagit County, and Snohomish County. These committees should be recognized by already established planning and response groups as well as in the planning documents so that they can become established members of the response community.

These committees should serve as a natural conduit for advice and input to the U.S. Coast Guard and the spill response section of the Washington DOE regarding issues and conditions that are unique to the local area. Information from the local MRC's can help regulatory agencies better understand conditions which influence the root causes of local marine incidents. Effective communication between regulatory agencies and the MRC's could provide a vital resource and information link to assist with the mitigation of immediate and delayed consequences of local marine accidents and should be actively pursued by all parties.



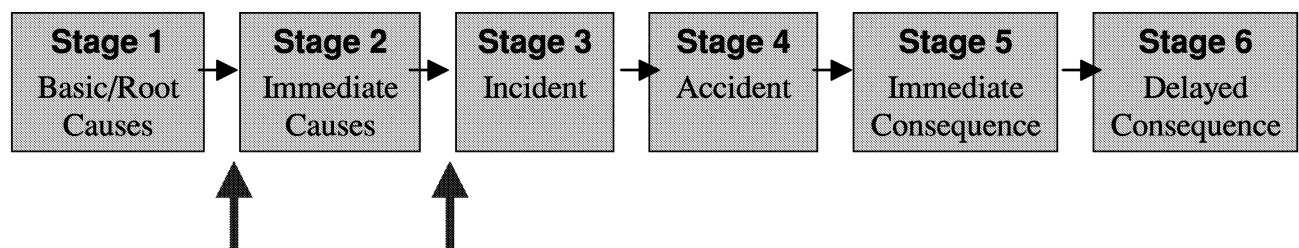
## Recommendation No. 8 – Improve Scope and Effectiveness of Inspection Programs

**Action:** The U.S. Coast Guard and Washington Department of Ecology, in consultation with Transport Canada Marine Safety, should improve and update the scope and effectiveness of existing vessel inspection programs by:

- a) continuing to refine targeting protocols to ensure vessels that pose the highest risks are inspected;
- b) continuously reviewing and enhancing inspection checklists to ensure they address appropriate risk factors;
- c) maintaining or expanding national/state inspection forces; and
- d) publicizing significant enforcement actions, as well positive industry actions to deter sub-standard vessel operators and promote safety improvements.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Vessel inspection programs have, in general, proven to be an effective means of reducing human, operational and organizational error, as well as shipboard system failures onboard vessels. Vessel inspections verify/ensure compliance with applicable maritime laws and regulations as well as identify any deficiencies in crew training and qualifications.



Inspections of vessels help identify conditions that might otherwise go undetected, thereby interrupting the accident causal chain at various points prior to the actual accident occurring. These programs are most effective when they are continually updated and executed by an adequate work force.

The U.S. Coast Guard has developed and operates an extensive Port State Control program that targets vessels based on risk and boards more frequently those vessels found to be at increased risk. The Captain of the Port may require additional safety measures or deny entry to any vessel that is found to present an unacceptably high level of risk. The State of Washington also has in place a risk-based targeting program for vessels. Likewise the Canadian government exercises port state authority and utilizes the Tokyo MOU for guidance and direction of their boarding program. Coordinating efforts in the realm of Port State control will produce the greatest return on the investment in the shared waters encompassed by this study area.

All inspection programs would benefit from increased number of inspectors affording the opportunity to expand the number and/or scope of vessel boardings. Agencies should review their current staffing levels to ensure adequate resources exist to enforce applicable marine safety regulations.

Public notice of significant enforcement actions against sub-standard operators can be an effective deterrent by both highlighting the potential ramifications of substandard operations to other operators and negatively influencing the decision of a potential vessel charterer. The current boarding programs operated by the U.S. and Canada recognize the poor performance records of certain vessel operators as well as flag states and classification societies and incorporate this information into the risk-based decision process. In the United States this information is made freely available to the public.

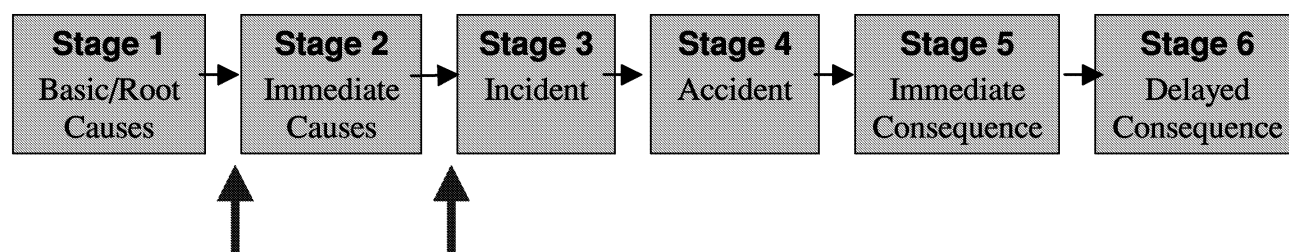


## Recommendation No. 9 – Education Program for Small Vessel Operators

**Action:** Washington State and the U.S. Coast Guard should establish a comprehensive educational program to ensure that unlicensed operators of small vessels have fundamental boating skills and seamanship knowledge. Options to be reviewed should range from seeking opportunities to increase attendance at existing courses to establishing statewide recreational boater requirements similar to those in effect in Canada.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 - Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Despite the existence of several boating safety programs aimed at improving the level of knowledge of recreational boaters regarding the rules of the road and their responsibilities while on the water, conflicts between small vessels operated by unskilled and/or uninformed personnel and deep draft vessels continue to occur.

The expanding volume of vessel traffic competing for space on the same waterway increases the likelihood of conflicts between large deep draft vessels and small commercial, fishing and recreational vessels. Conflicting vessel operations make navigation more difficult for the deep draft vessels and increase the likelihood of reactionary radical course and/or speed changes with an attendant potential for accidents such as collision.



There are several mechanisms in place to prevent operational conflicts and educate the recreational boater.

- “Rules of the road” establish a common base for steering and sailing vessels so as to minimize the potential for conflicting operations. Formalized as International Regulations for Preventing Collisions at Sea, 1972 (COLREGS 72), these rules apply to all sizes of recreational and commercial vessels operating in navigable waters, including Haro Strait and the Strait of Georgia.
- Cooperative Vessel Traffic Management System actively manages vessels larger than 40M, and passively manages vessels larger than 20M. As this system is geared toward the management of larger vessels, it does directly influence smaller vessels also identified as a concern.
- Education sources for safe boating operations include: a Washington State Parks and Recreation Commission pamphlet entitled “Washington Boating Basics – A Guide to Responsible Boating”, and boating safety courses offered by the U.S. Coast Guard Auxiliary and the U.S. Power Squadron.
- Canada addresses the need for universal boater education by operating a National program that teaches recreational vessel operators fundamental marine skills and knowledge.

In conclusion, conflicts between small and large vessels are believed to stem, at least in part, from a lack of understanding of fundamental seamanship skills and marine knowledge on the part of some small vessel operators. Improving the knowledge level of unlicensed small vessel operators addresses both the root and immediate causes that result in conflicting vessel operations.

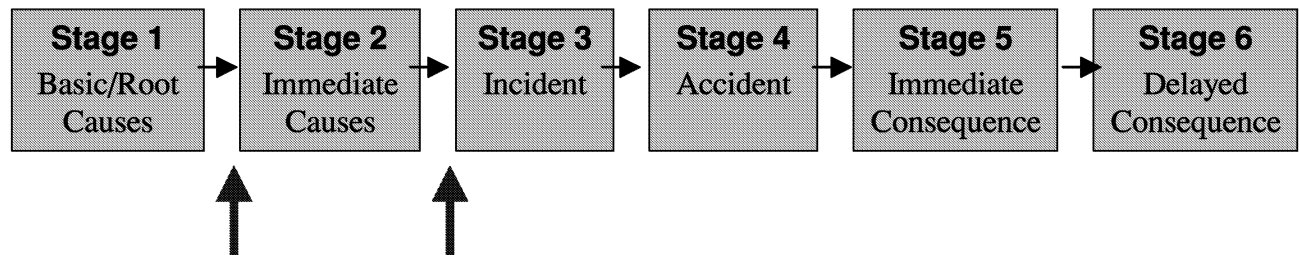


## Recommendation No. 10 – Expansion of CVTS Participation Requirements

**Action:** The U.S. Coast Guard should review the current requirements for vessel participation in the US/Canadian Cooperative Vessel Traffic System (CVTS) with an eye toward aligning more closely with Canadian requirements. In an effort to reduce potentially conflicting operations all vessel traffic greater than 20 meters in length should be required to actively participate in the CVTS.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 – Northern Approach
Drift Grounding	Conflicting Operations	2 – Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** The current U.S. regulations (33 CFR 161) that pertain to CVTS mandate that all vessels greater than 40 meters in length, towing vessels greater than 8 meters and vessels certificated to carry greater than 50 passengers for hire, while engaged in trade, actively participate in the traffic management system. Active participation requires that vessels participate in the Vessel Movement Reporting System (VMRS) and make regular movement reports to the CVTS watchstander. Vessels greater than 20 meters are passive participants in the system which requires that they monitor the frequency used by CVTS, either VHF Ch. 5A (outer Strait) or VHF Ch. 14 (Puget Sound).

Canadian regulations differ from the U.S. in that they require all vessels greater than 20 meters in length to actively participate in the CVTS.



Those commercial vessels that are not required to actively participate in the traffic management system have the potential to negatively effect the ability of other vessels, which are participating in the system, to safely navigate the waterway. The movements of vessels not participating in the CVTS can be unpredictable and may result in conflicting operations with an attendant increase in the likelihood of a collision. Furthermore, different standards for participation in US/Canadian waters may result in confusion from lack of uniformity.

Expanding the requirement for active participation to all vessels greater than 20 meters will improve communication and predictability of vessel movements thereby reducing the likelihood of vessel collisions. Increasing the level of vessel traffic management through active participation in CVTS will reduce the possibility for human error and conflicting vessel operations and correspondingly intervene early in the casual chains.



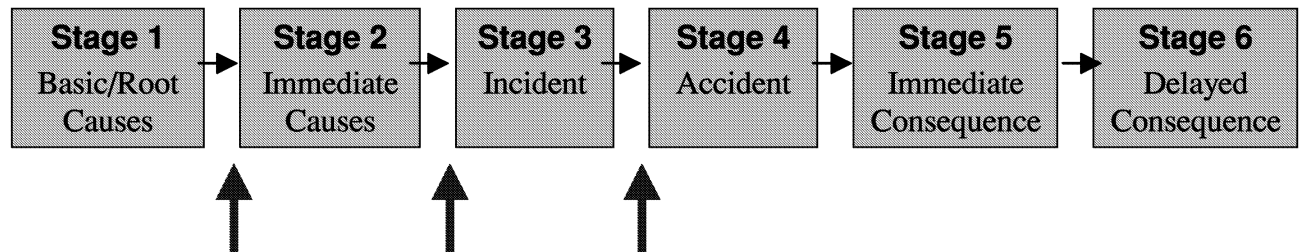
## Recommendation No. 11 – Trans-Boundary Process for Maritime Safety Issues

**Action:** The U.S. Coast Guard, Canadian Coast Guard and Washington Department of Ecology should establish a trans-boundary public process of appropriate stakeholders to comprehensively review prevention of, and response to, the risk of both oil and hazardous material spills in the shared waterways of Haro Strait, Boundary Pass and adjacent waters.

- a) Recommendations pertaining to traffic management issues should be referred to the Joint Coordinating Group (JCG).
- b) Recommendations pertaining to oil and hazardous material response measures should be referred to the Northwest Area Committee and the Canadian Environmental Response Regional Advisory Council.
- c) Recommendations pertaining to other risk mitigation measures should be directed to the appropriate federal, national or state agencies.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Haro Strait and Boundary Pass are the primary channel for vessels transiting to and from Vancouver, B.C. and other Canadian ports. The waterway is relatively confined and is bounded on both sounds by archipelagos that are home to diverse and varied marine life. Each year there are approximately 3000 transits of deep draft vessels. Bulk cargo



vessels comprise the largest portion of this traffic, however towboats with barges as well as passenger vessels use the area with increasing frequency. During the summer months the volume of traffic grows primarily due to recreational vessels.

This stretch of water is unique in several regards which place it at high risk for accidents caused by collisions, powered groundings, or drift groundings. These include the narrowness of the waterway (1 NM at its narrowest point), occurrence of localized fog banks, absence of established traffic lanes, strong currents and eddies, large volume of small vessel traffic (including commercial whale watching vessels), and a greater than 90 degree turn with obstructed visibility. Because of the confluence of these characteristics this waterway is at higher risk than surrounding waterways and merits specific risk mitigation measures.

The waterway straddles the U.S. Canadian border and the Canadian Coast Guard as part of the Cooperative Vessel Traffic System (CVTS) handles traffic control. Accordingly, the JCG is the appropriate governing cross border mechanism for addressing traffic management and risk mitigation measures.

Implementation of other traffic management measures aimed at breaking the causal chain early in the sequence will reduce the likelihood of incidents, which result in oil spills in the region.

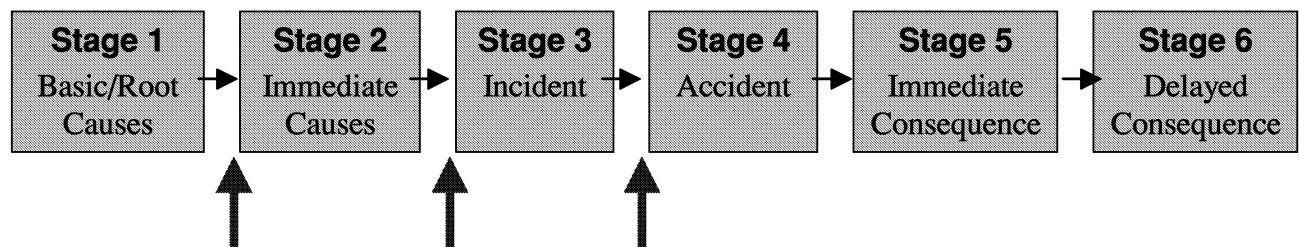


## Recommendation No. 12 – Towing Vessel Standards

**Action:** The U.S. Coast Guard, American Waterway Operators, other industry groups and their Canadian counterparts should work to encourage all commercial tank barge towing vessel operators to meet the highest industry wide standards, such as the AWO Responsible Carrier Program and/or the ISM/ISO standards within the study area. The U.S. Coast Guard, in consultation with Transport Canada Marine Safety, should review current policies toward towing vessels and develop a program which targets sub-par operators and ensures a uniformly high level of safety.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 - Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** In the Puget Sound region, all types of vessel traffic can be found transiting the waterways. Tow boats and their tows make up a significant percentage of overall vessel traffic. The national accident rate for tow boats, particularly when towing tank barges is unacceptably high. Furthermore tank barges carry a substantial quantity of oil and pose a relatively high risk to the marine environment.

The current level of risk posed by tank barge tows depends in part on the business practices and operating standards of individual companies. Some companies have chosen to adopt self-imposed standards beyond any regulatory mandate, which improve safety and reduce risk. The American Waterway Operators has developed a Responsible Carrier Program that



establishes a heightened level of safety aboard vessels operated by member companies. This program offers a starting point for regulatory agencies to begin to encourage all towing companies to conform to uniformly high standards. This program should focus on operators who fail to meet industry standards.

The current U.S. regulatory regime does not require inspection of most towing vessels. However, tank barges are inspected under 46 CFR Subchapter D and the operator of any towboat greater than 26 feet in length must possess an appropriate Coast Guard license.

Increasing the standards that tank barge tows are subjected to will intervene in the causal chain in the early stages by reducing the likelihood of human error, conflicting operations and loss of vessel control as possible causes of collisions, drift groundings, or powered groundings.

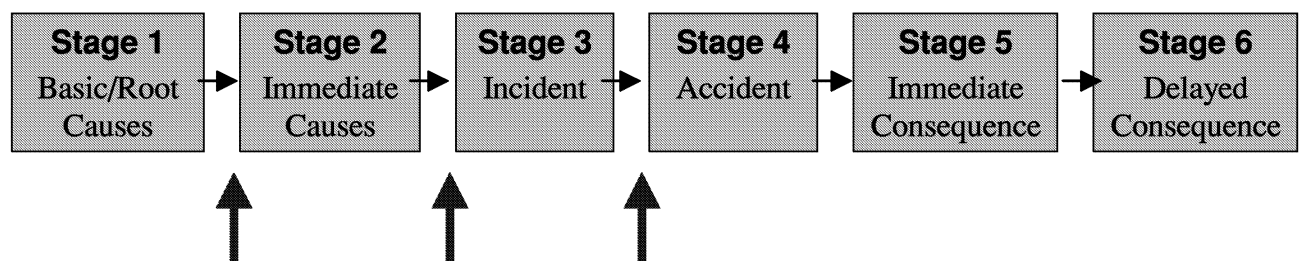


## Recommendation No. 13 – SOC-Steering Gear Testing

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety, should develop a Standard of Care which details appropriate additional actions to be taken by vessel's crew in preparation for entering port or confined waters such as testing, inspection or manning of the vessel's steering. The establishment of a local Standard of Care will provide more specific guidance and improve the consistency and completeness of such actions beyond that required by regulation while also serving as a valuable reminder to vessel crews and highlighting practices unique to the waters throughout the study area.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 - Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

Vessels are usually designed with redundant critical systems and other precautions so that a mechanical failure does not result in a loss of vessel control that can result in a casualty. Nevertheless, systems do fail. As a result, law and convention both require testing of all systems, including the steering gear, prior to a vessel's entry into port. In this way, a system



deficiency can be identified and repaired while still in the relatively less hazardous environment of the open ocean.

Failure of the crew to adequately prepare their vessel prior to entering confined waters could result in the loss of steering control too late to avoid a collision or powered grounding. Accordingly, the safe maneuvering of a vessel through navigationally challenging waters would involve the establishment of prudent precautionary actions.

This Standard of Care could be an effective non-regulatory method of capturing and implementing good marine practices related to testing of a vessel's steering gear thereby mitigating the risk of collision and grounding and intervening at a point early in the causal chain.

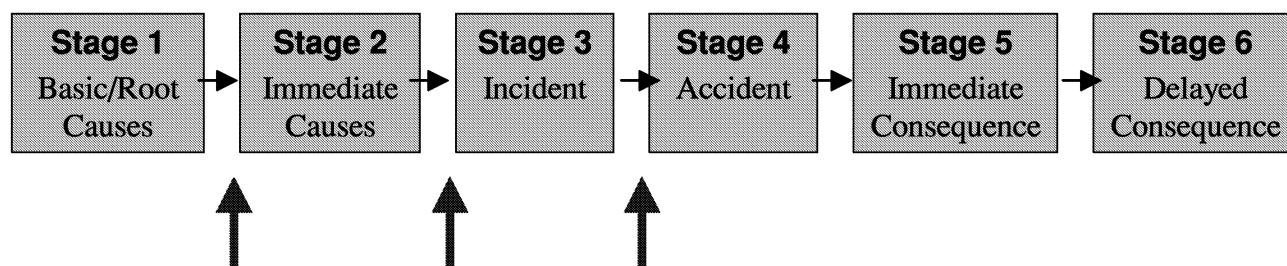


## Recommendation No. 14 – SOC-Offshore Routing

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety, and appropriate stakeholders, should develop a Standard of Care that establishes an offshore route for all dry cargo vessels traveling to or from ports to the south such that vessels will join or depart the western extension of the Traffic Separation Scheme at a point well offshore of Cape Flattery consistent with the limits of the Area To Be Avoided (ATBA) and other offshore routing initiatives.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

The coastline of western Washington is unique in its diversity and environmental sensitive. Any measure which increases the buffer between vessel traffic and the coast will reduce the probability of an oil spill that affects the shoreline. Routing measures which keep vessels a greater distance offshore as they make the approach to the traffic separation scheme will increase the orderliness of the approach and reduce the likelihood of operational conflicts. In



addition the increased distance provides more time for responding resources to prevent a vessel from drifting aground and mitigates the risk of an accident that results in an oil spill affecting the outer coast.

The Olympic Coast National Marine Sanctuary is currently protected by an Area-To-Be-Avoided (ATBA) which requests that tank vessels voluntarily remain west of this area. The ATBA in its current configuration does not apply to cargo vessels, but compliance with this recommendation would coincidentally have the affect of expanding the applicability of the ATBA to cargo vessels.

Routing of cargo vessels to a point 35 miles west of the “J” buoy would keep them well clear of the existing or expanded ATBA boundaries (as proposed in the Port Access Route Study) and offers an increased level of protection. In addition to this proposal this Panel has recommended that the applicability of the ATBA be expanded to all deep draft vessels and that a review of the effectiveness of voluntary compliance with the ATBA be made. Further, these issues are under review by the State/BC Oil Spill Task Force, Offshore Routing Study and the proposed recommendation would necessarily have to be coordinated with any offshore routing measures resulting from this study.

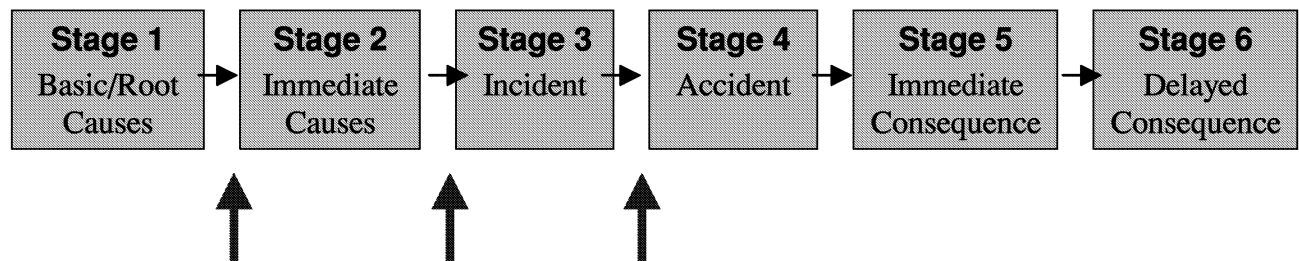


## Recommendation No. 15 – SOC-Planned Maintenance

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety, and appropriate stakeholders, establish a Standard of Care which addresses planned maintenance aboard large commercial vessels while operating in the waters of the study area.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 – Northern Approach
Drift Grounding	Conflicting Operations	2 – Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

A number of vessels have opted to perform vessel maintenance involving critical systems such as the propulsion plant while operating in the waters of the Strait of Juan de Fuca. Such operations may result in a loss of control of the vessel for a length of time. While these maintenance events are intentional on the part of the vessel crew, they may not reflect sound decision-making and good marine practice. In many instances the maintenance may take considerably longer than planned. What begins as 15 minutes of drifting can easily turn into several hours with the vessel at risk of drifting aground. Such planned maintenance is an ill-



advised risk-based decision that fails to place appropriate significance on the environmental sensitivity in the area and chooses convenience over prudent seamanship.

The prudent mariner should conduct maintenance of this type while at sea, while safely anchored or while at berth so that time delays do not place the vessel in imminent danger. The Standard of Care should address appropriate measures to ensure that vessel maintenance that results in a loss of control of the vessel is performed with adequate safety measures in place. This might include requiring vessels to be, no closer than 12 miles from shore, clear of the traffic lanes, at anchor, or have standby tugs in the immediate vicinity.

The goal of this recommendation is to communicate to mariners that vessel maintenance, which results in an intentional loss of control capabilities of the vessel, is unacceptable in the study area. This recommendation intervenes in the casual chain by ensuring that appropriate risk factors are included in decisions by the vessel crew, and ensuring that the vessel is not placed in a condition which could result in a collision or drift grounding.

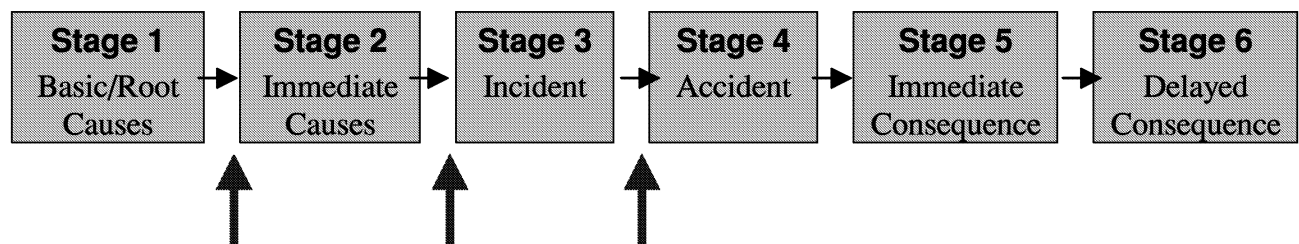


## Recommendation No. 16 – SOC-Firefighting

**Action:** The U.S. Coast Guard and the Washington State Department of Ecology, in consultation with the Canadian Coast Guard and appropriate stakeholders, should develop a detailed Standard of Care which ensures that onboard fire fighting equipment is functional and the vessel's crew is trained as a proficient team such that together they are capable of effectively suppressing a shipboard fire.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

Shipboard firefighting is heavily regulated, with international and national (both Canadian and US) standards existing which address the types and configuration of firefighting equipment aboard vessels. Both U.S. regulation and the Safety of Life at Sea (SOLAS) Convention address fire protection, detection and extinction in a great deal of detail. In addition, the International Convention on Standards of Training Certification and Watchkeeping (STCW) provide detailed guidance on the conduct of onboard fire drills.



Recognizing this, the fact remains that a vessel fire can result in the loss of propulsion or steering aboard the vessel, which could in turn result in an oil spill.

Equipment requirements vary depending on the size of the vessel and the type of cargo carried. The installation of firefighting equipment alone does not ensure that a fire will be successfully extinguished. The essential elements in successful fire suppression are that the equipment and vessel crews perform as intended

While prevention of a fire in the first place is the priority, should one occur the priority becomes suppression of the fire as quickly as possible. Quick identification of the source of the fire, isolation of the space, and then deployment of fire suppression equipment is crucial to quick fire suppression. In spite of national and international regulations, not all vessel crews maintain firefighting equipment properly or are adequately trained and familiar with the firefighting equipment aboard their vessels. In these cases the opportunity for containing the fire can be lost. The effect of this can be propulsion and/or steering loss that leaves the vessel at risk of grounding and causing an oil spill.

Vessels that are targeted for boarding under the Port State initiatives of U.S. and Canada are checked for the adequacy of firefighting and other safety equipment. In all cases the vessel's crew is required to perform a fire drill in the presence of the inspectors. Frequently these drills highlight deficiencies in equipment or the professional competence of the vessel's crew. Drills assist in the identification of substandard conditions.

A standard of care that details the expectations for fire drills and crew competency in regard to firefighting should improve the ability of the crew to be prepared for a fire onboard and quickly and effectively suppress it. Identification of a clear set of guidelines and expectations with regard to firefighting readiness will mitigate the potential for accidents should a fire occur and reduce the likelihood of human error. Although not the focus of this Panel, in addition to oil spill prevention, this measure would have direct safety of life at sea benefits.

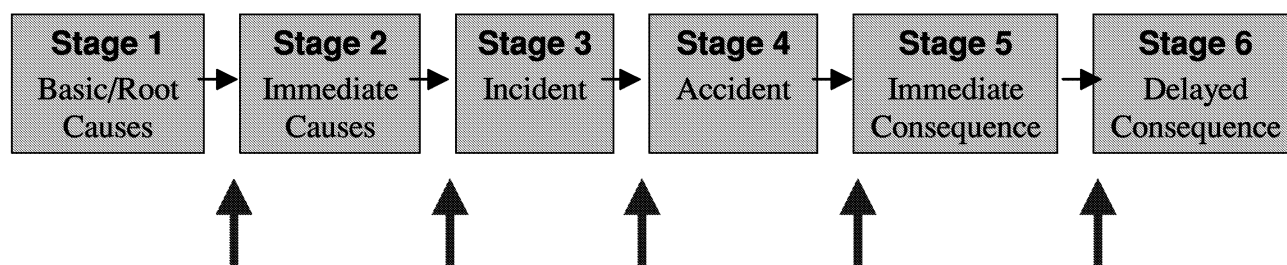


## Recommendation No. 17 – Partnership with Tribal Nations

**Action:** Tribal, state, and national governments should look for every opportunity to build upon existing partnerships in the interest of enhancing marine safety and protection of natural marine resources in ways that honor government to government relationships.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 - Strait of Juan de Fuca
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		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Marine habitats within the Olympic Coast National Marine Sanctuary are considered a state and national treasure and are vital to the economic, social, and cultural survival of tribes that reside on the Olympic peninsula. Tribes, such as the Makah people, are afforded sovereign nation status with a unique and vested interest in preserving their natural heritage. In recognition of their interests and treaty rights, the Tribes, along with the U.S. and State Governments, are considered trustees of natural marine resources located within their treaty-protected areas. Moreover, they possess knowledge and interests that are critical to effective planning efforts for, and actual responses to, marine accidents. A quick and effective response with clearly identified common goals can best be realized with the Tribes as full and active participants in all phases of the planning and response process.

The Makah currently participate in the Northwest Area Committee, which is the group that develops plans for oil spill response and maintains the Area Committee Plan.



There is always room to improve cooperation and communication between Tribal governments and federal and state agencies with responsibilities in oil spill planning and response. To this end the U.S. Coast Guard and the Washington State Department of Ecology must actively seek opportunities to improve this relationship. The time to establish and nurture these relationships is before an accident occurs as early cooperation and team building can potentially interrupt the causal chain at all intervention points.

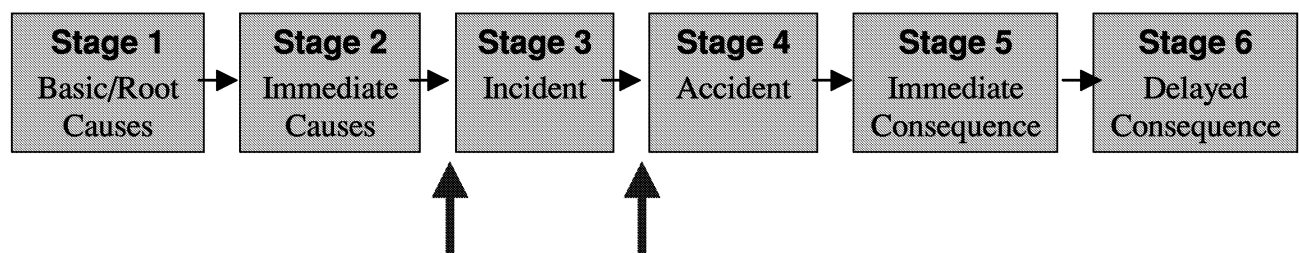


## Recommendation No. 18 – Support States/BC Oil Spill Task Force

**Action:** The U.S. Coast Guard and State of Washington should reduce the risk associated with offshore marine transportation through the efforts of the joint USCG PACAREA and States/BC Oil Spill Task Force *West Coast Offshore Vessel Traffic Risk Management Project*. Specifically, this project work group is urged to recommend measures that would help prevent vessel casualties from becoming incidents, and provide more time for rescue/assist vessels to reach disabled vessels thereby preventing an incident from becoming an accident.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
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Powered Grounding	Physical Environment	3 - Strait of Juan de Fuca
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		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** In 1998, the U.S. Coast Guard Pacific Area and States/BC Oil Spill Task Force formed a workgroup to evaluate and recommend appropriate changes to offshore vessel traffic management for the purpose of reducing the risk of vessel collisions and/or drift groundings off the U.S. and Canadian Pacific coast. Using the model from the Monterey Bay National Marine Sanctuary Offshore Vessel Routing Measures Project as a basis, the workgroup is examining alternative offshore vessel routing with the goal of reducing the risk of vessel collisions and/or drift groundings.

Routing vessels of varying risk of an oil or hazardous materials spill at specified distances from shore would improve marine safety by providing rescue/assist vessels more time to



respond to a disabled vessel, thereby preventing it from drifting aground. Additionally, the stratification of traffic would reduce the potential for conflicting operations by vessels traveling at different speeds, thereby preventing collisions.

Such improvements in vessel traffic management help prevent accidents and increase intervention opportunities early in the causal chain prior to the escalation of an incident to an accident.

The workgroup is fully aware of the routing alternatives being considered in the U.S. Coast Guard's Port Access Route Study (PARS) for the Straits of Juan de Fuca, and is committed to ensuring compatibility of its recommendations with those that will be forthcoming from PARS.



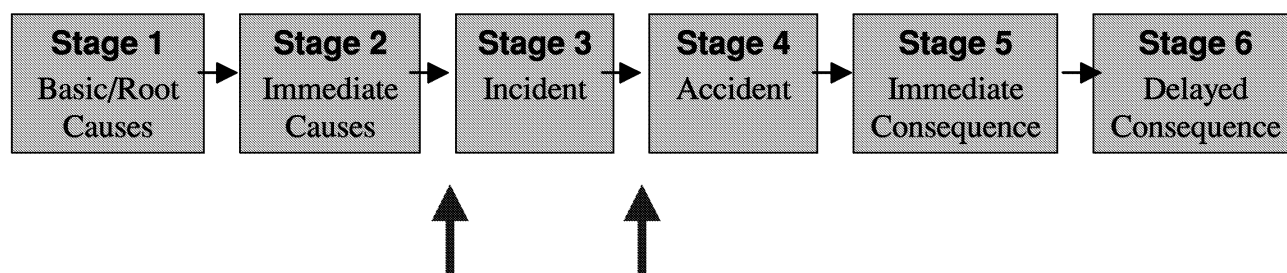
## Recommendation No. 19 – Support for PARS

**Action:** The U.S. Coast Guard should:

- a) expedite completion of it's Port Access Route Study (PARS) for the Straits of Juan de Fuca and adjacent waters;
- b) promptly implement vessel routing measures which will add order and predictability to the marine transportation system while increasing the buffer between commercial vessels and the land. Specifically, the Panel supports issue/recommendation Nos. 1-3, 4a-f, 5, 7a-c, 8b-d, 10a, and 11a as proposed in the Federal Register [see Appendix 9]; and
- c) ensure there is complete international coordination of the proposed modifications.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
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Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
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Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** In January 1999, the U.S. Coast Guard initiated a Port Access Route Study (PARS) for the purpose of evaluating the continued applicability of and need for modifications to the current vessel routing measures in and around the Strait of Juan de Fuca. The joint U.S. and Canadian Coast Guard/Transport Canada review concluded that existing waterways management measures could be modified to realize reduced vessel accident risk, improved order and predictability of the marine transportation system, and improved efficiency of vessel traffic management.



The proposed revision of vessel routings will add order and predictability to diverse segments of vessel traffic, thereby reducing the potential of collision from conflicting vessel operations. In addition, the re-routing of vessels further offshore will provide vessels with a larger buffer to land and other vessels, thereby minimizing the potential for drift and powered groundings, also providing more time for emergency tow vessels to respond to a disabled vessel.

These measures will break the causal chain both by preventing accidents and allowing greater opportunity for intervention to prevent escalation of an incident into an accident.

Residual concerns regarding PARS recommendations can and should be addressed through the public review process.

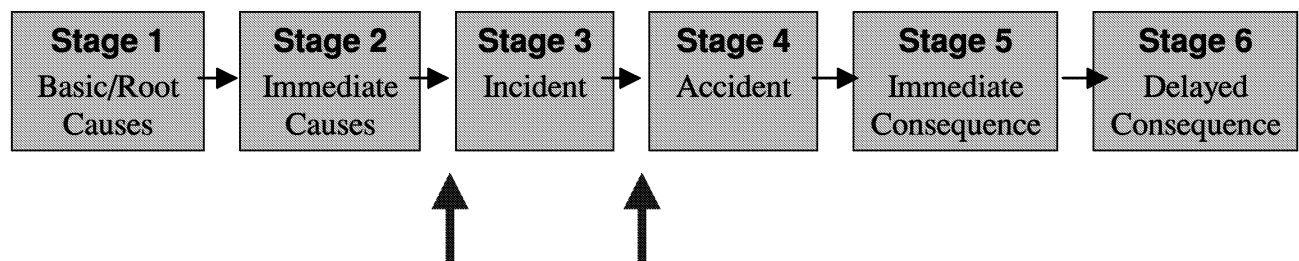


## Recommendation No. 20 – Implementation of UAIS

**Action:** Implementation of a Universal Automatic Identification System (UAIS) is considered an effective tool for both ship-to-ship collision avoidance and ship-to-shore vessel traffic management. Accordingly, the U.S. and Canadian Coast Guards should promote the expeditious establishment of UAIS transponder/receiver technical standards and vessel carriage requirements by the International Maritime Organization (IMO).

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 – Northern Approach
Drift Grounding	Conflicting Operations	2 – Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** The carriage of a Universal Automatic Identification System (UAIS) represents a dramatically improved method of displaying important collision avoidance information on the bridge of a ship. UAIS provides real-time, highly accurate vessel identification and positional information that is not degraded by weather or sea conditions; can “see around corners”; requires NO user interaction to acquire/track the contact; and eliminates all ambiguity in determining the identity of a contact of consequence. These features are considered extremely important in promoting timely and effective conflict resolution especially during low visibility meeting situations.

There are also significant advantages from a vessel traffic management perspective. With a traditional radar-based Vessel Traffic Service (VTS), it is not practical to provide radar coverage of the entire Area of Responsibility (AOR). For example, there is no radar coverage



within the San Juan Islands, Hood Canal, and the waters south of Tacoma. With UAIS, the VTS will be able to “see” significant traffic throughout the entire AOR, providing value to a larger geographic area.

Introduction of UAIS will also minimize the need for the VTS watchstanders to provide lengthy traffic advisories to vessel bridge crews. Relieved of this communication burden, the Pilot/Master will be free to focus more on the safe navigation of the vessel.

Uniform use of UAIS would improve the accuracy, timeliness and availability of vessel information, thereby preventing incidents through improved collision avoidance, also provide information that will enable vessel operators and traffic managers to respond more effectively in order to prevent escalation of an incident to an accident.

At the present time there are viable non-UAIS-based systems operating within Puget Sound. However, it appears unlikely that these systems will meet UAIS technical transmit standards. For UAIS to be successful, it is imperative that transmission, reception and display standards be harmonized so that the system works equally well in all areas of the world. This desired outcome can only be accomplished by working through the IMO.

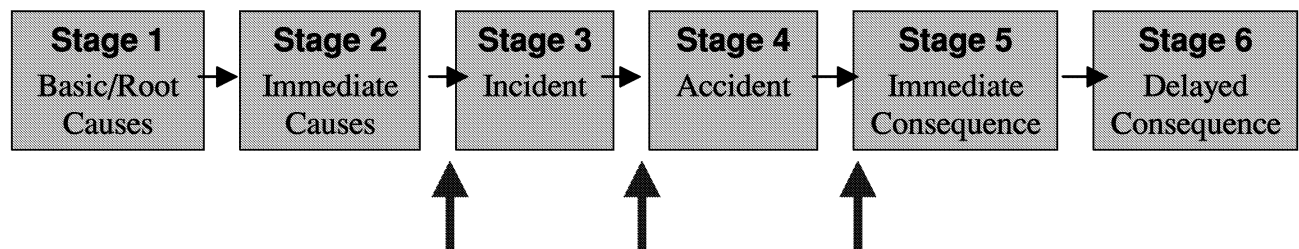


## Recommendation No. 21 – SOC - Anchors

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety and in conjunction with appropriate stakeholder groups, should develop a Standard of Care addressing under what conditions vessels should have anchors “ready for letting go” when operating within the waters of the study area.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

System failures may leave vessels adrift and at risk of grounding. These circumstances tend to develop unexpectedly and leave the crew with a short time window for taking appropriate action. Many vessels entering the Strait have their anchors in various states of readiness, which may or may not allow for quick deployment of the anchor.

Upon notification of this type of a system failure the Captain of the Port will require that tugs be dispatched to assist the drifting vessel. Depending on the location of the vessel casualty



and the location of the vessel it may be some time before a rescue resource is on-scene. In the interim there are actions the crew can take to mitigate the potential for a drift grounding. Vessels which have their anchor prepared for “letting go” are able to deploy this effective resource much more rapidly than if the anchor remained housed in the at-sea state.

The term “ready for letting go” can be interpreted in many different ways. Accordingly one goal of the Standard of Care developed under this recommendation should be to establish sufficient guidelines and details so that various classes of vessel enter the Northern Strait with anchors in an appropriate state of readiness.

While the goal is to prevent the initial incident which resulted in a loss of control of the vessel, the anchor in many instances is a measure that the vessel is able to deploy to check the progress of its drift. While the waters in and around Puget Sound may be too deep to make anchoring effective in many cases, that is not true in all areas and in no way reduces the effectiveness of this relatively simple measure to interrupt the causal chain.



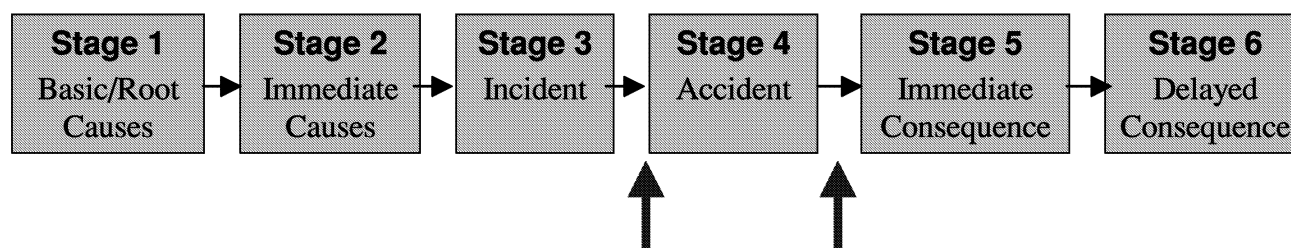
## Recommendation No. 22 – ATBA – Applicability, Size, and Compliance

**Action:** The U.S. Coast Guard, in cooperation with the National Oceanic and Atmospheric Administration (NOAA) Marine Sanctuary Division should:

- a) Continue to review the level of compliance with the voluntary Area-To-Be-Avoided (ATBA) and evaluate its effectiveness;
- b) Expand the size of the ATBA westerly and northerly as proposed in the preliminary PARS proposals contained in the Federal Register [Appendix 9]; and
- c) Expand the applicability of the ATBA from only tank vessels and barges carrying petroleum or hazardous materials in bulk, to other deep draft vessels.

<b><u>Accident Type</u></b>	<b><u>Accident Cause</u></b>	<b><u>Geographic Coverage</u></b>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### **Accident Causal Chain and Points of Intervention**



**Rationale:** The Olympic Coast National Marine Sanctuary (OCNMS) currently advises operators of tank vessels or barges carrying petroleum oil or hazardous materials in bulk to voluntarily remain outside the established boundaries of the ATBA. Accordingly other types of deep draft vessels, which also carry potentially significant quantities of fuel oil, are not precluded from transiting through the ATBA.



A recent review of vessel traffic transiting the ATBA found compliance of excluded vessels to be in excess of 95%. Such a high level of voluntary compliance has been attributed to the aggressive education/outreach efforts of the OCNMS and U.S. Coast Guard Captain of the Port. These monitoring programs should remain in place to ensure future compliance with the ATBA. The question of whether to change the compliance mechanism from voluntary to mandatory is the subject of review under the PARS and the Offshore Routing Study being conducted by the State/BC Oil Spill Task Force.

The PARS recommends modifying the approach lanes to the Strait, and expanding the ATBA in a northerly and westerly direction. These changes would keep transiting vessels further offshore and increase the available response time in the event of a propulsion or steering casualty, thereby increasing the protection of the following: the usual-and-accustomed areas of the Makah, Hoh, Quileutte, and Quinault Tribes, Olympic National Park, Needles Point, Flattery Rocks, and Copalis National Wildlife Refuge.

Deep draft vessels can carry large quantities of fuel which pose a risk of an oil spill to the areas listed above. Expanding the applicability of the ATBA to include commercial vessels carrying significant quantities of fuel oil moves these vessels further offshore, increasing the time available to respond to a propulsion or steering casualty, and decreasing the potential for a drift or powered grounding.

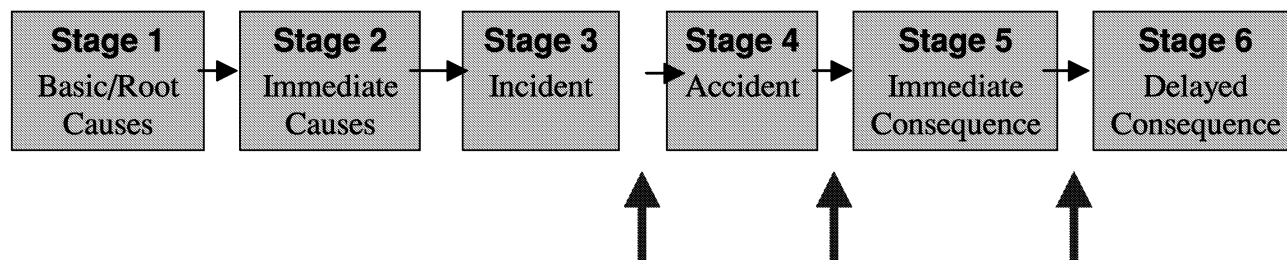


## Recommendation No. 23 – SOC – Vessel Towing Arrangements

**Action:** The U.S. Coast Guard, in consultation with Transport Canada Marine Safety, should develop a Standard of Care for the officers and crew to be knowledgeable and capable of setting up towing arrangements and ensuring that the configuration has the strength to safely undertake the tow.

<u>Accident Type</u>	<u>Accident Cause</u>	<u>Geographic Coverage</u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### Accident Causal Chain and Points of Intervention



**Rationale:** Standards of Care are a recognized method of capturing and implementing good marine practice and sound port customs that have developed over time. Using this methodology allows lessons learned to be capitalized upon quickly by making timely adjustments to the appropriate Standard of Care. Furthermore sufficient flexibility exists such that Standards of Care can be tailored to unique or geographic-specific concerns.

The ability of a towing vessel to effectively render assistance to a vessel in distress depends upon a number of factors including the capability of the crew to prepare for the tow, the strength and configuration of the “disabled” vessels towing arrangement. Preparations made by the vessel requiring towing assistance will ensure that towing vessels can quickly and effectively undertake the tow.

Vessels from many different countries utilize the waters found in the study area. Although international standards apply to all vessels, each vessel may be built to differing standards



depending on the flag state and which classification society the vessel owner decided to utilize. While these “class” standards determine an adequate level of structural integrity aboard vessels the towing configuration may not be sufficiently detailed. The disabled vessel must be prepared to be taken under tow quickly. There are steps that can be taken by the vessel crew to increase the ease with which a vessel can be taken under tow. These preparations include elements such as proper rigging of tow equipment and that the points of attachment are of adequate strength.

A Standard of Care that addresses specific steps that a vessel crew should take to ensure maximum readiness for towing is essential to a rapid and effective response to a vessel adrift. Preparing the vessel for the likelihood of towing increases the ability to check the vessels progress if it is adrift and reduces the chances of the crew making an error that would diminish the chances of successfully taking the vessel under tow.

This recommendation assists rescue resources with timely and rapid intervention in the event of a vessel casualty, breaking the causal chain at points after the accident.



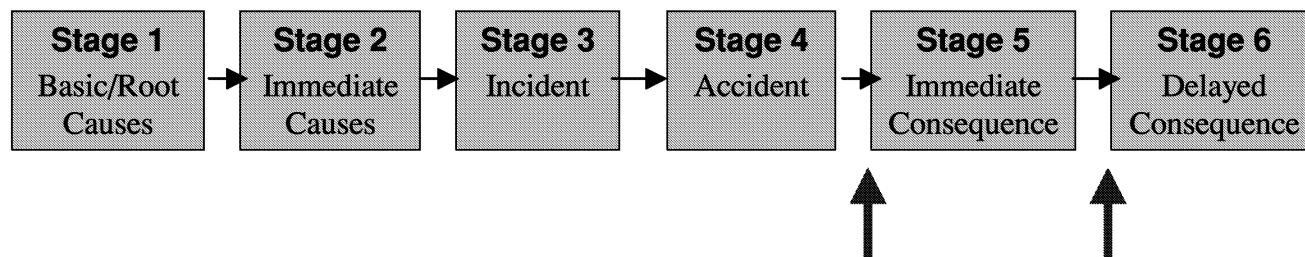
## **Recommendation No. 24 – Response – Area Committee Action Items**

**Action:** The U.S. Coast Guard, Canadian Coast Guard, and Washington Department of Ecology, should utilize appropriate resources, such as the Northwest Area Committee and Canadian Regional Advisory Council to review the following response issues:

- a) establish performance based drill and exercise criteria to assess the effectiveness and timeliness of existing response strategies contained in current industry response plans;
- b) distribution of spill response equipment and identification of areas where response capabilities can/should be improved. Areas of interest include open water recovery in Haro Strait/Boundary Pass and the San Juan Islands, near-shore response for highly sensitive embayments (e.g. Padilla Bay, Mud Bay, and Hunter Bay in the San Juan Islands), as well as offshore and the approaches to the Strait of Juan de Fuca, including the current placement of the Higher Volume Port Line;
- c) completeness and accuracy of emergency response vessel inventory, particularly towboats;
- d) the adequacy of Area Committee policy for involving county elected officials and emergency management personnel in the unified command; and
- e) training and use of local volunteers for various aspects of spill response and appropriate role in the Incident Command Structure (ICS);
- f) salvage and firefighting contingency plans.

<u><b>Accident Type</b></u>	<u><b>Accident Cause</b></u>	<u><b>Geographic Coverage</b></u>
Collision	Human and Organizational Error	1 - Northern Approach
Drift Grounding	Conflicting Operations	2 - Western Approach
Powered Grounding	Physical Environment	3 – Strait of Juan de Fuca
Structural Failure	Vessel Control	4 - PA to Admiralty Inlet
Fire	Positional Information	5 - PA to Victoria/Haro St.
		6 - San Juan Islands/Rosario St.

### **Accident Causal Chain and Points of Intervention**





**Rationale:** Prevention of an oil spill is the first priority. However, should a spill occur, adequate response resources must be readily available for an effective and timely response. The Oil Pollution Act of 1990 (OPA 90) provided for the establishment of Area Committees and charged them with the development and maintenance of an Area Contingency Plan (ACP). The ACP builds on the National Contingency Plan and addresses local environmental sensitivities as well as resources and strategies.

The North West Area Committee is comprised of a broad section of the spill response community, regulatory agencies and marine industry.

The Canadian Regional Advisory Committee (RAC) is a council legislated in the Canada Shipping Act and the members are appointed by the Commissioner of the Coast Guard. They are volunteers who represent the marine community and are mandated to advise the Minister on spill response preparedness in the Pacific region.

The Panel recognizes the value of ongoing spill response exercises that analyze spill response readiness, and identify successes and areas of potential gaps in the response system. One such pertinent and timely exercise is the Western Strait Response Table Top Exercise conducted August 30, 1999. A report of this exercise is attached in Appendix 11.

There are several geographic areas that might benefit from increased proximity of spill response equipment. Haro Strait and the offshore region are two areas that may have insufficient timely coverage of oil spill response equipment. In recommending a review of the current placement of the Higher Volume Port Line, the Panel intends no pre-judgment on the merits.

The Area Contingency Plan contains a list of available response resources which includes an inventory of towboats. Many, but not all of these towboats participate in the International Tug of Opportunity System (ITOS). The ITOS system allows the Captain of the Port and other interested parties to know the location of participating towing vessels. In the event of an accident this information is essential to dispatching the closest and most appropriate rescue resource. However the quality of passive information such as that captured by the Area Contingency Plan should be reviewed and updated to ensure it is as accurate as possible.

There is an active and interested group of environmental activists and concerned citizens in and around the study area. In the event of a spill this group will actively seek involvement in the response and clean-up. In the event of a significant oil spill the Federal On Scene Coordinator (FOSC) will establish an Incident Command Structure (ICS) which will be staffed by spill response personnel from a wide variety of agencies and industry. While there are liability and qualification issues surrounding assignment to some areas of the clean up, there may be opportunities for pre-spill training in other areas, such as wildlife rescue and rehabilitation. The North West Area Committee should review the status of volunteers and local public officials in the Integrated Command Structure (ICS) and seek solutions that will ensure that they will play a meaningful role in a spill response while ensuring that liability and qualification issues are addressed.



Firefighting and salvage assistance may not be sufficient to stage an effective response. In particular the lack of large salvage resources may be problematic in most areas of the country as highlighted on the West Coast during the 1999 grounding and salvage of the M/V *New Carrisa* off the coast of Oregon.

Success with any of the above measures will intervene at points in the causal chain after an accident has occurred.



## **VII. Other Measures Considered**

During the development of the recommendations there were several topics for which it became apparent that consensus would not be reached in accordance with Panel's procedural agreements [Appendix 5]. There were a number of reasons why this was true with conflicting views on the gap (or need) for the measure, time constraints, lack of expertise and the technical complexity of the topic being the primary reasons. These Other Measures Considered capture issues that were discussed extensively by the Panel but were not passed. The format used is designed to provide a balanced view and capture both the supporting and opposing view.

The votes recorded for Other Measures Considered are included to show the balance of pro and con positions. Although Panel co-chairs were counted as members present for quorum, they did not vote. All recommendations (Section VI) were passed in accordance with the panel rules, i.e., consensus minus two being an affirmative vote.



## **Other Measure Considered No. 1 – Regional Citizens Advisory Committee**

**Issue:** Should a securely funded, adequately staffed Regional Citizens Advisory Committee (RCAC), similar to the Prince William Sound Regional Citizens Advisory Council, be established in Puget Sound?

**Discussion:** The Oil Pollution Act of 1990 (OPA90 Section 5002) provided for the establishment of citizen advocacy groups known as Regional Citizens Advisory Committees (RCAC's). The OPA90 legislation called for an advisory group in Prince William Sound that consisted of representatives from commercial fishing organizations, aquaculture associations, environmental organizations, recreational organizations, and Alaskan Native groups. This RCAC was designed to provide advice and recommendations to the oil association on port operations, policies and practices. Furthermore, in addressing other RCAC's the OPA 90 legislation specified the make up of committee membership plus a number of other criteria that must be met as part of establishment.

At the time of the passage of OPA 90 there was an organization already in existence called the Alyeska Citizens Advisory Committee. The legislation, in recognition of this group and the fact that they did not meet specific RCAC requirements, provided for an Alternative Voluntary Advisory Group. This alternative group is the model utilized in the current Prince William Sound Regional Citizens Advisory Committee. An alternative group of this nature should satisfy the basic intent of the RCAC provision in OPA 90, but does not have to meet all the specific requirements.

In addition to specifying the establishment of the RCAC, the OPA 90 legislation provided a secure funding mechanism. The funding source for the Prince William Sound RCAC is the Aleyska Corporation. Finally, OPA 90 intended that the concept of regional citizens advisory committees be reviewed for effectiveness, and institutionalized if they were found effective.

**Position in Support of Issue:** RCAC's are the ideal forum for citizen's to promote environmentally safe operations of the marine industry and to combat industry, government and public complacency regarding marine environmental protection. The Prince William Sound Advisory Committee promotes safe operations of the oil industry through the work of four volunteer technical committees: Port Operations and Vessel Traffic Systems Committee, Oil Spill Prevention and Response Committee, Scientific Advisory Committee and Technical Operations, and the Environmental Monitoring Committee. The existing system of advisory committees in Puget Sound provides few opportunities for citizens to fully participate and influence the decision-making process. To ensure that all interests are included prior to a decision being made it is essential that a group of interested citizens with no affiliation with



the marine industry have a forum to voice their concerns as equal partners in the decision-making process.

While industry reaps the benefits of their commercial activities it is the citizen who must bear the burden of any accident. The result is that those who are the most likely to be directly effected by a large oil spill are the least able to participate in planning and prevention decisions. It is for this reason that the inability of citizens to participate in and influence the decision-making process is unacceptable. Effective and equitable decisions can only be made with input from all stakeholders, including citizens. This is best done through a citizen organization established to provide direct input.

The issues to be considered by a citizen's advisory groups are potentially larger than just local marine safety issues. Other pollution prevention issues associated with other industries, such as pipeline safety, are ideally suited for this type of citizen committee and could be melded into one.

A secure source of funding is essential to the establishment and success of a RCAC in the study area. The Prince William Sound RCAC is currently funded by Alyeska. In 1989 the president of Alyeska, Bob Malone, said, "There's no doubt in my mind that RCAC has added value to both the response and prevention side of what we are doing in Prince William Sound." While there is not a sole industry such as Alyeska from which to easily draw money in this region, this is not an insurmountable problem and should be addressed as part of the process that establishes this committee. The value provided by the establishment of a citizen's group, such as a RCAC, easily justifies the cost.

**Position Opposed to Issue:** There is a desire by some parties to form a Regional Citizens' Advisory Council similar to the Alternative Program to OPA 90 which exists in Prince William Sound. It is the view of those opposed to the forming of a Puget Sound RCAC that a more effective partnership can be forged through the likes of Harbor Safety Committees.

The Alaska program is by its nature largely "problem seeking" rather than "problem solving," often with no apparent benefit. While there have been many unquestionable and noteworthy improvements, the Alaskan alternative program falls short of achieving the mechanism envisioned by OPA 90 to foster long term partnerships of industry, government and local communities.

Citizen influence through involvement in discussion and development of issues that affect them is essential, proper and encouraged. However, Harbor Safety Committees with broad stakeholder participation are a more efficient alternative to the Alaska citizen council model. The latter does not fully embrace certain organizational fundamentals, such as:

- Desire to partner through consensus as a result of constructive dialogue.



- Membership largely limited to elected officials who are more likely to place matters in context with broader issues that concern the affected community.
- Insist the organization speak and act as a unified voice.
- Equitable funding among all beneficiaries and tied to genuine need.
- Ability to see itself as an advisory group, not as a quasi-regulator.

Successful partnering means that interested parties must be content with reaching middle ground, and the best forum for this has proven to be Harbor Safety Committees and the like. A Harbor Safety Committee, or its similar equivalent, is more appropriate to accommodate vast differences between Puget Sound and Prince William Sound. In Puget Sound there are several industries engaging in trade throughout the region, many of them from foreign countries. Additionally, the region is large and diverse, and many different geographic areas have unique and different interests. In Puget Sound there are already numerous entities with marine and environmental safety as their primary concern including the Northwest Area Committee, the Puget Sound Marine Committee, and numerous environmental advocacy groups. Further, there is currently no mechanism to fund a Puget Sound RCAC. Identification of an equitable funding sources is problematic as the industry in the study areas is quite diversified and not concentrated into a single entity as in Prince William Sound.

The measurable benefit of a Puget Sound RCAC is unclear. The purpose and structure for the Prince William Sound RCAC is very different for what is needed and proposed for Puget Sound. The differences between Prince William Sound and the study region are sufficient in number to conclude that the appropriateness and effectiveness of an RCAC for the study area are not warranted. There are already forums in place. Most significant is the Puget Sound Marine Committee that, with certain modifications to membership, would adequately serve the needs of the area, and ensure that a comprehensive risk-based approach to marine safety and environmental protection occurs.

**Vote:** Discussion occurred, action tabled and later withdrawn by the proponents.



## **Other Measure Considered No. 2 – The Study of Extension of Pilotage Requirements**

**Issue:** Should the Washington State Board of Pilotage Commissioners and the Washington State Legislature conduct a study to determine if extending pilotage westward to the entrance to the Strait of Juan de Fuca is warranted?

**Discussion:** The current pilotage regulations require that most deep draft vessels embark a pilot in the vicinity of Port Angeles for those vessels bound for ports in the United States, and off Victoria for vessels bound for Canadian ports. The topic of extended vessel pilotage requirements is very complex and a limited amount of time was available to pursue the entire breadth of Panel topics. Accordingly, a conclusion was reached that this issue could not be addressed in sufficient detail to allow for a definitive recommendation. The Panel voted unanimously not to recommend extending pilotage, however a recommendation was introduced to request a study of the issue to be conducted by the Washington State Board of Pilotage Commissioners and the Washington Legislature.

The issue of geographic extension of pilotage requirements beyond current standards has been raised periodically in this region. Pilotage was one of 6 measures put forward by the Thirteenth Coast Guard District in a Federal Register notice dated May 22, 1990. Five of these measures were referred back to the Coast Guard Headquarters staff for inclusion in the Oil Pollution Act of 1990 rulemaking, but the pilotage issue was not considered for rulemaking. In addition, the States/BC Oil Spill Task Force recently completed an in-depth study of pilotage issues. Although the complete rationale is perhaps not clear, in each case there has been no decision to support the extension of pilotage.

The Volpe report as well as the Port Access Route Study identified the entrance to the Strait of Juan de Fuca and the Port Angeles rotary as segments of the waterway that are at a relatively high risk of vessel collisions. U.S. pilots currently board vessels just east of Port Angeles and assist with pilotage through local waters enroute to its final destination within Puget Sound. Canadian pilots board Canadian bound vessels just south of Victoria BC and help pilot the vessel to various ports.

**Position in Support of Issue:** Extension of the pilotage requirement mitigates the risk of vessels transiting the waters of the Strait of Juan de Fuca with a focus on preventing collisions and powered groundings by breaking the causal chain at points prior to an incident. Under the current pilotage system, vessels transit approximately 70 nautical miles through the Strait of Juan de Fuca without the benefit of a pilot. This is reportedly the only major U.S. shipping lane left unprotected by lack of pilotage. While these vessels are crewed by licensed and qualified crews, they may not possess specific knowledge regarding the unique



characteristics of the waterway. Pilots bring local expertise and knowledge as well as good communications skills to these vessels.

While neither pilots nor ship crews are immune from human error, together they are less likely to make mistakes of a human nature than the vessel's crew alone. Crews whose communications skills are hampered by language difficulties directly impact the risk of a transit. The pilots' familiarity with both the waterway and the traffic management system, as well as their known English speaking capability, make them less likely to have a human error induced accident. This is an effective means for reducing the inherent risk posed by a lack of familiarity with local waters.

Furthermore, pilots are well versed on the particular requirements of the Cooperative Vessel Traffic System (CVTS). Embarking/disembarking pilots in the vicinity of the "J" buoy will improve the ability of vessel traffic managers to communicate with vessels throughout their transit of the Strait of Juan de Fuca.

Considering that a large percentage of the ships visiting U.S. waters are foreign-flag vessels, and considering the potentially wide range of training and expertise among their crews, West Coast pilots carry a critical burden of responsibility regarding safe vessel transits.

The potential benefits of extending pilotage merit further review.

**Position Opposed to Issue:** The extension of vessel pilotage requirements west to Cape Flattery brings with it a number of complications; some of which act to dramatically increase the level of risk at the western entrance to the Strait, some are pilot safety concerns, and some have logistical and cost implications. When analyzing the cost to benefit ratio of this measure these issues must be considered.

Professional mariners are required by international standards to be fully proficient in navigation, and can reasonably be expected to successfully navigate the Strait of Juan de Fuca to Port Angeles. The Strait is a relatively wide, straight and deep body of water with an established pro-active Vessel Traffic Management System.

The identified heightened risk for the entrance to the Strait in the Volpe Report was primarily attributed to congestion and conflicting vessel operations.. The process of embarking and disembarking a pilot typically requires some maneuvering and speed changes on the part of the vessel. Movement of the pilot station west would require this maneuvering to take place at the natural convergence point, which is an area already identified as having conflicting vessel operations.

The U.S. Coast Guard considered this option as one of six potential safety measures for the Strait of Juan de Fuca in 1990. Boarding pilots at the mouth of the Strait was the only option considered more hazardous than beneficial, and was dropped from further consideration. It was further demonstrated by the supportive testimony of professionals how vessels



maneuvering to provide a safe lee for boarding or discharging pilots posed confusing meeting or crossing situations for other vessels without the benefit of an established “rotary” such as exists at Port Angeles.

Although compelling in 1990, these thoughts are much more relevant today with the addition of the ATBA and Olympic Coast National Marine Sanctuary to the maneuvering area. The CVTS Port Access Routing Project includes four slow traffic lanes in addition to the normal navigational lanes and TSS, which would funnel more meeting and crossing traffic into the confusion created by vessels having to maneuver in order to embark or disembark pilots.

The weather and sea conditions found at the western entrance to the Straits are frequently hazardous enough to cause safety concerns during the pilot embarking/disembarking process. Whether pilot boarding is accomplished by using the traditional pilot boat or by using a helicopter, there are dangers associated with this endeavor that must necessarily be mitigated.

An experimental helicopter based pilot boarding program is underway on the Columbia River Bar. The experiment is developing a stream of experience that can be analyzed in the future to determine the benefits, if any. The preliminary evaluation from the vessel managers is that helicopter operations are prohibitively expensive and provide no apparent benefit.

In addition to the hazards and disadvantages noted above, the static discharge sparks generated by helicopter operations render helo/tanker operations extraordinarily hazardous.

Extension of the pilotage requirement would also result in a number of logistical issues. The increased length of the trip would likely mean that one pilot would not be able to make the entire transit due to work hour restrictions. This fact would require that either a second pilot exchange would have to take place at the current pilot boarding area off of Port Angeles, or a second pilot would have to be embarked initially at the entrance to the Strait. Each of these options have increased cost and safety concerns, and may not address the congestion off Port Angeles that has also been identified as a concern. Since vessels entering the Strait are bound for both U.S. and Canadian ports, the coordination of U.S. and Canadian pilots would also create logistical and trade problems.

In summary, the USCG was correct in 1990 in not pursuing this item, and no further study is warranted.

**Vote:**

Members present:	16*
Yes:	6
No:	6
Stand aside:	2

\*Includes the Panel’s two non-voting co-chairs.



### **Other Measure Considered No. 3 – Mandatory versus Voluntary TSS**

**Issue:** Should the Traffic Separation Scheme (TSS) within the study area be changed from voluntary to mandatory for some vessels?

**Discussion:** In the study area joint waterway management is accomplished through the Cooperative Vessel Traffic System (CVTS) which is operated by both the Canadian and U.S. Coast Guards. The CVTS utilizes radar and radio coverage to manage vessel traffic. In addition to the CVTS there are other vessel routing measures and traffic management tools. The Traffic Separation Scheme (TSS), comprised of routing measures such as traffic lanes, separation zones, and precautionary areas, is a central component of this system.

The current traffic management plan provides compulsory participation in the CVTS for certain size vessels. However, adherence to the TSS is voluntary. Compliance with this latter system is assured by VTS watchstanders who use authority vested in them by 33 CFR 161.11 to issue “VTS Direction” requiring specific vessels to use the TSS. Despite this practice, there is a general perception that a mandatory TSS is better than a voluntary system.

The issue is currently under analysis by the U.S. Coast Guard as part of the Port Access Route Study (PARS).

**Position in Support of Issue:** Changing the use of the TSS to a mandatory system will increase safety in the waterway by improving predictability of vessel movements, reducing the potential for human error and ensuring that non-compliant vessels are subject to full legal liabilities. Although largely anecdotal, there are indications that the establishment of a mandatory TSS would ease related enforcement actions. Furthermore, there is a sense that an operator’s concern over potentially heightened liability levels associated with deviation from a mandatory TSS would serve as a deterrent to unsafe operations.

The appropriate parameters for which vessels should be required to participate is best determined as part of the Port Access Route Study. In this regard, the CVTS has indicated that larger deep draft vessels capable of maintaining a speed of 12 knots are the most appropriate users of the TSS. If these vessels are currently complying with the voluntary TSS then making the TSS mandatory for those vessels should not be any additional burden.

The Canadian Coast Guard, through a modification to Rule 10 of the International Regulations for Preventing Collisions at Sea, requires all vessels greater than 20 meters in length to follow the TSS when it is safe to do so. A similar modification to the COLREGS in



U.S. waters would improve comparability of traffic management practices between the two nations by eliminating this non-uniformity.

When it is necessary, VTS should have the authority to direct vessels not to use the lanes.

**Position Opposed to Issue:** The current voluntary TSS is reported to have nearly full compliance for those vessels for which compliance is desired. Accordingly, if the ultimate desire is to gain compliance to enhance traffic order and predictability, then a regulatory standard has been proven unnecessary to gain vessel compliance.

The voluntary TSS offers the greatest level of flexibility to both mariners and traffic managers, and establishes an appropriate level of safety. If the TSS is made mandatory for all vessels currently participating in the CVTS it could result in increased risk (decreased safety) by increasing the number of vessels in the lanes, some of which operate at widely disparate speeds.

Although the Canadians have a mandatory TSS system they do not aggressively enforce this provision. They have found that the provision results in the mixing of vessels with large disparate speeds and increases the likelihood of conflict. Therefore, there is no need to establish a mandatory system that would limit the abilities of the traffic managers to effectively address vessel risk in the waterway.

**Vote:**

Members present:	15*
Yes:	0
No:	7
Stand aside:	6

\*Includes the Panel's two non-voting co-chairs.



## **Other Measure Considered No. 4 – Harbor Safety Committee**

**Issue:** Should the U.S. Coast Guard and Washington Department of Ecology, in cooperation with appropriate stakeholders, work to establish a fully developed Harbor Safety Committee?

**Discussion:** Several committees currently exist in the study area that address issues pertaining to the marine transportation system. However, each has a real or perceived difference in focus with the result being that not all stakeholders are actively engaged on issues of importance. In many ports Harbor Safety Committee-like organizations have been developed. Successful committees generally combine the expertise of local users and constituents with the legal authority of the appropriate government agencies to develop effective management plans for addressing issues within the waterway. These committees are not focused solely on deep draft commercial traffic, but look more broadly and address the needs of all vessel operators as well as environmental and other concerns.

The current committee in the Puget Sound region that most closely resembles a Harbor Safety Committee (HSC) is the Puget Sound Marine Committee (PSMC). PSMC was initiated by the marine industry and is comprised primarily of stakeholders representing that industry and regulatory agencies.

**Position in Support of Issue:** This particular recommendation resulted from a potpourri of Panel members proposals of how to address the need and value of citizen participation. The utilization of the concept of a Harbor Safety Committee seemed to be an effective forum for integrating the numerous proposals.

Harbor Safety Committees (HSC's) are typically composed of a diverse group of interested stakeholders, and can include environmental advocacy groups, the port authorities, shipping interest, passenger vessel operators, fishing industry, recreational boaters, waterfront development interests, county and city representatives, as well as others. These committees address not only issues associated with port and waterway growth and traffic expansion, but also environmental issues, economic viability, and long term plans for development of both waterways management and infrastructure. Examples of issues that would be appropriate for the HSC to address would be: waterfront growth and congestion associated with increasing vessel traffic, traffic routing concerns over confined waterways (ex. Haro or Rosario Strait), vessel controls which incorporate weather parameters, extension of pilotage, tug escorts, as well as many other topics of concern. These committees are uniquely positioned to identify areas of increasing or changing risk, and then identifying risk management strategies that address stakeholder concerns and mitigate the risk.

PSMC is a valuable and useful committee whose contributions are in no way diminished by the concept of a fully realized Harbor Safety Committee. PSMC may very well be an excellent foundation for realization of a fully developed Harbor Safety Committee. The HSC



will provide a broader more representative forum for continuing the discussion of many of the issues that have been identified but not pursued during this Panel process.

Development of a Harbor Safety Committee in this region is crucial to ensure that an adequate and appropriate avenue exists for stakeholders to voice their concerns, and a way to actively implement solutions. Development and fostering these relationships are critical to the ongoing health and viability of this diverse and unique waterway.

**Position Opposed to Issue:** The Puget Sound Marine Committee (PSMC) is a Harbor Safety Committee. PSMC is a valued and productive committee that contributes meaningfully to a myriad of complex issues that face the maritime community. For example, PSMC took the lead and developed a comprehensive protocol for the exchange of ballast water to minimize the threat of introduction of non-indigenous species into the waters of Puget Sound.

During the course of discussion on this issue it was obvious that PSMC could work to expand its membership to be more inclusive of several stakeholder groups. PSMC would welcome the interest and commitment of a broader group of people who could help the committee evolve and provide even better service.

Formation of the HSC under the auspices of a government agency is severely limiting. PSMC, as a private organization funded on an “ability to pay” basis, is afforded a flexibility and freedom to act that would be lost with a Harbor Safety Committee set up under the constraints that government agencies impose on organizations. Examples of limitations are membership mandates, procedural rules and funding. PSMC is working well in its current configuration. Changing the guidelines for this committee would eliminate the flexibility and procedures that have proven themselves to be effective.

David Schneider presented the following perspective: Initially there was confusion about the role of the Puget Sound Marine Committee (PSMC) as a Harbor Safety Committee. Helpful and positive suggestions were advanced to help insure localized issues could be identified and receive the expert attention they deserve. There was consensus that local issues may well be addressed within the context of Marine Resource Committees (where these exist) or such other local mechanisms as may be appropriate. PSMC could then be accessed as a vehicle to coordinate studies and recommendations, help identify and define appropriate measures, institute recommended actions, and promulgate expectations. The existing close working relationship between PSMC, U.S. Coast Guard, Washington State Department of Ecology, and other diverse stakeholder groups that comprise PSMC, confirms its role as Puget Sound's Harbor Safety Committee.

**Vote:**

Members present:	18*	*Includes the Panel's two non-voting co-chairs.
Yes:	0	
No:	10	Four Panel members offered no response.
Stand aside:	2	



## Other Measure Considered No. 5 – Dedicated Rescue Tug

**Issue:** Should the United States and Canadian governments enhance the International Tug of Opportunity System (ITOS) by funding the deployment of a dedicated rescue tug for the international waterway at the entrance of the Strait of Juan de Fuca and adjacent ocean waters?

**Position in Support of Issue:** A dedicated rescue tug should be available year-round at Neah Bay<sup>23</sup> to ensure that an adequate tug is available at all times to respond to a drifting vessel (and other types of incidents) in the Western Strait of Juan de Fuca and coastal waters of Washington and British Columbia, and to decrease response time.

Funding arrangements for this recommended rescue tug must be economically neutral for commerce to and from ports in the United States and Canada. Commercial transits through the shared waters of the Strait of Juan de Fuca are approximately equal to ports in the United States and Canada. Therefore, the U.S. and Canada should share equally in funding this rescue tug. This proposal should be a matter of priority in discussions between the U.S. State Department and Canada. Deployment of a dedicated rescue tug is urgent; therefore, until Canada funds its share the U.S. Government should fund it fully.

Many funding arrangements have been discussed. However, via the recent U.S. Supreme Court decision<sup>24</sup> the U.S. federal government has asserted its constitutional primacy over safety regulation in these waters, thus successfully preempting certain Washington State maritime safety laws. The U.S. government also has solemn Treaty obligations to the Makah Tribe and other Indian tribes in this region whose culture and economy is dependent upon the utmost protection of the marine and coastal environment and their usual and accustomed fishing grounds from the devastation of oil spills. Important federal assets of great national value would be damaged by any oil spill, including the Olympic National Marine Sanctuary, the coastal strip of Olympic National Park, and numerous national wildlife refuges. These federal responsibilities and the urgency of achieving a practical permanent deployment of a rescue tug, justify that the greatest portion of the U.S. share of the cost of this rescue tug should be borne by the federal government.

Trade through Puget Sound ports benefits not only this state but also the entire nation. Approximately 80% of the relative volume of cargo originates or terminates beyond the boundaries of the State of Washington to the direct benefit of the people of the other 49 states. This fact should be recognized in the funding formula for a dedicated rescue tug.

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<sup>23</sup> There are currently physical limitations on the size of vessel that can operate from Neah Bay during certain low tides. This recommendation is based on the size of rescue tug deemed necessary to meet the mission. Priority should be given to dealing with any physical limitations of the harbor.

<sup>24</sup> *United States vs. Locke*, No. 98-1701, decided March 6, 2000.



The continuity of rescue tug coverage is paramount. The U.S. federal government and the State of Washington should employ all possible means to assure the sustained availability of appropriations as recommended here.

The primary mission of this dedicated rescue tug is to arrest the drift of a disabled vessel to prevent a pollution event. As long as its primary mission is not jeopardized, the tug should be equipped and available to provide other emergency rescue services and early assistance in oil spill response. These services include:

- Providing intervention support for the Coordinated Vessel Traffic Service
- Assist in search and rescue efforts
- Marine firefighting
- Early oil spill response

The specifications for a suitable tug should be addressed by a group of experts convened by the U.S. Coast Guard and Washington Department of Ecology. These experts should include those recommended by local government, industry and environmental groups.

The annual operational cost for a suitable rescue tug meeting these requirements ranges from \$3,500,000 to \$7,000,000 including amortization.<sup>25</sup> The higher figure is the most probable. Cost includes charter of a stand-in replacement tug during periods when the dedicated rescue tug is out of service for general maintenance, repair and annual dry-docking, or on a specific rescue assignment.

The role and performance of this rescue tug should be routinely evaluated as part of overall assessments of the maritime safety systems of the U.S. and Canada in this region. The permanence of this rescue tug is a critical element in the marine safety system; any decision to remove or reduce this important oil spill prevention asset must be made by affirmative decision, and not by any form of automatic “sunset clause.”

This recommendation reflects the unique circumstances and challenges to maritime safety, and oil spill prevention in the Western Strait of Juan de Fuca as well as the Washington and British Columbia coasts.

A dedicated rescue tug stationed at the entrance of the Strait of Juan de Fuca will significantly improve oil spill prevention for both the United States and Canada. It will round out the present coverage by commercial tugs, and place a vessel equipped for arresting drifting vessels (and for other collateral duties) as well as a trained crew at a point readily accessible for incidents developing in the western Strait, the ocean approaches and along the coasts of British Columbia and Washington. It will significantly reduce response times, enabling a tug to reach a drifting vessel far sooner than can be assured in any other way.

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<sup>25</sup> These estimates are based upon the recommendations of the 1994 Emergency Towing System Task Force and on data developed as part of the U.S. Coast Guard’s “Regulatory Assessment” [see especially p. 58-59]. Costs in this same range were derived in the 1995 cost-benefit analysis prepared for the Province of British Columbia.



In a cooperative effort between the industry associations of British Columbia and Washington State, the International Tug of Opportunity System (ITOS) has been implemented on a voluntary basis by the shipping industry at its own expense. The system provides transponders on approximately 100 Canadian and U.S. tugs operating in the shared waters. The Marine Exchange and the Cooperative Vessel Traffic System monitor tug activity. Location and physical attributes of tugs operating are displayed for rapid identification of assets in the event of an emergency.

The U.S. Coast Guard evaluated ITOS in a report published in August 1999, and concluded "... (ITOS) provide(s) an incremental improvement to the existing marine safety system."<sup>26</sup> The study emphasized, however, "What is important is the determination of how big a gap there is in tug coverage."<sup>27</sup> Analyzing real-world data, Coast Guard studies show a lower incidence of tugs present in the outer strait when commercial vessels were present than for other portions of the study area, thus revealing an oil spill prevention gap in the waters at the entrance of the Strait and adjacent ocean waters.

The Coast Guard review found that "there is approximately a 15% chance that there is an ITOS tug in the vicinity of the intended operating area of the [proposed] dedicated rescue tug."<sup>28</sup> Assuming that any ITOS tug is available, willing and technically equipped to hook up to and slow the drift rate of a vessel in distress, the study concluded that ITOS eliminates approximately 11% of the risk of a significant oil spill throughout the region and 9% for the offshore approaches.<sup>29</sup>

Using different methodology the Coast Guard's Regulatory Assessment found that "ITOS is expected to reduce the number of drift groundings by approximately 3% in 2000 and 6% in 2025."<sup>30</sup>

There are two gaps in oil spill prevention coverage associated with the outer Strait of Juan de Fuca and ocean approaches:

- The review of ITOS confirms a lower probability of an adequate and available commercial tug of opportunity in the outer Strait and ocean approaches than in any other portion of the study area.
- There are fewer response assets for the containment and recovery of spilled oil in the outer Strait and ocean approaches than in the marine waters further east.

The 1997 Volpe Report concludes: "Environmental sensitivity generally drops as one moves west to east while response efficacy increases."<sup>31</sup>

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<sup>26</sup> "Analysis of the Geographic Coverage Provided by the International Tug of Opportunity System From November 1998–May 1999," U.S. Coast Guard, 30 August 1999.

<sup>27</sup> *Ibid.*, p. 36.

<sup>28</sup> *Ibid.*, p. 16. It is noteworthy that the Executive summary states: "Not addressed in this analysis are issues such as the adequacy of the power of ITOS tugs or their ability to hook up to a vessel in distress".

<sup>29</sup> *Ibid.*, p. 51. These assumptions are not warranted and the risk reduction is thus even less than implied here.

<sup>30</sup> "Regulatory Assessment: Use of Tugs to Protect Against Oil Spills in the Puget Sound Area," prepared for the U.S. Coast Guard, Report No. 9522-002, November 15, 1999, p.47.

<sup>31</sup> "Scoping Risk Assessment: Protection Against Oil Spills in the Marine Waters of Northwest Washington State," published by the John Volpe National Transportation Systems Center, July 18, 1997, p.86. [Cited here as "Volpe Report"]



In the final analysis, each person, each organization and each segment of the shipping industry assesses the maritime oil spill risk at the entrance of the Strait of Juan de Fuca in their own way, reflecting their own interests. It is evident however, that the people of the State of Washington have concluded that current maritime safety measures in this particularly vulnerable and valuable area are not adequate to protect the public interest.<sup>32</sup>

The oil spill risk from commercial vessel traffic in these waters is not static. Both vessel traffic and public concern for the consequences of a large oil spill are increasing. The growth in international trade to and from both the United States and Canada will fuel ever-greater traffic by ever-larger vessels with ever-larger tanks of bunker fuel. While double hull tankers will be phased in for the U.S. oil trade in these waters by 2015, well before that time the greater share of the risk will have shifted to dry cargo vessels simply because of the rapid growth projected in their trade through the Strait.<sup>33</sup> Risk is further elevated by the rapidly growing use of these waters by recreational boats of all kinds.

The people of Washington State and the United States place enormous value on the integrity of this natural environment, as witnessed by the dedication of the outer coastline as part of Olympic National Park and the adjacent offshore area as the Olympic National Marine Sanctuary. Moreover, the serious deterioration of the marine environment, particularly within the Strait and Puget Sound, has called forth a tremendous commitment of public effort and funding. Examples include the listings (completed and pending) of more and more species under the Endangered Species Act – and the significant public sacrifices that will be required to restore these species – as well as the urgency Congress felt in approving and funding the Northwest Straits Initiative.

An overriding factor necessitating placing a response tug in the outer Strait is the treaty obligation of the Federal Government to protect the Usual and Accustomed lands of the tribes in Washington State. There is embodied within the treaty an absolute obligation to the protection of the marine environment.

The deployment of additional towing assets in the greater Puget Sound basin adds to the emergency response capability in the event of a disabled vessel. The greatest potential for an asset reducing a hazard would be in response to a drift grounding.

It is important to note that industry stakeholders are currently contributing to the protection of the marine resources in several ways:

- The tanker industry through taxation and required tug escorts for laden tankers transiting east of Port Angeles, as well as in the additional costs to build and operate double-hulled tankers.

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<sup>32</sup> This is demonstrated by the 1991 state law mandating an emergency towing system at the entrance of the Strait of Juan de Fuca by 1992, by the growing support of state and federal legislators and the elected commissioners of the most affected counties, and by the significant funding devoted to interim tug protection by both the Clinton Administration and the State Legislature.

<sup>33</sup> "Regulatory Assessment: Use of Tugs to Protect Against Oil Spills in the Puget Sound Area," prepared for the U.S. Coast Guard, Report No. 9522-002, November 15, 1999.



- The dry cargo and tanker industries through its voluntary funding of the International Tug of Opportunity System (ITOS).
- Both the dry cargo and oil tanker industries support oil spill response organizations.

Prevention of an oil spill is altogether preferred over spill cleanup efforts that are inherently of limited success and very costly. In addition to the economic, environmental and social benefits to society in general, the shipping industry itself stands to gain from the improved oil spill prevention capability represented by a dedicated rescue tug at the entrance of the Strait in two primary ways:

1. The ship owner involved in an incident which, as a result of the services of a dedicated rescue tug, does not unravel into a major oil spill gains by avoiding huge costs, including liability and punitive damage claims.
2. The shipping industry as a whole gains by avoiding the far more intense regime of operating regulations which would inevitably be imposed upon it in the political aftermath of a major oil spill in these essentially urban waters.

**Position Opposed to Issue:** The proposal for a tug is fiscally irresponsible where there is not a cost-benefit ratio that supports the expense, regardless of the source of funds.

Using data directly cited in the regulatory assessment performed by Herbert Engineering and basic probability analysis, one reaches a much different position than presented by the authors of that report. It requires making only one assumption: “The value of a dedicated tug is only in the arrest of a drifting vessel.”

For collisions and powered groundings a dedicated tug is essentially of little value.

To arrest a drifting vessel the probability of success is determined by the product of the probabilities of the dependent events.

The arguments against the issue rest with the assumption above and the use of three facts from the report:

- 5.5 year return of an oil spill is a 0.18 probability of an incident in any one year.
- 8% of the incidents resulting in an oil spill are from drift grounding.
- Only half of the attempted drift arrests were projected to be successful.

The probability of preventing an oil spill from a successful recovery of a drifting vessel is 0.0072 in any given year, or a return of a successful arrest every 139 years. Accordingly, the probability alone makes the event so remote that the cost-benefit approaches nil.

If the actual incident data for the past 10 years is used the return period of this analysis is even longer.



Comments related to points made in the Tug Recommendation:

- Comments about INTERTANKO are not germane to the discussion of a dedicated tug. The Court's decision had nothing to do with the right of the State or anyone else in placing a dedicated tug.
- In the New Carissa case the first available tug was unable to assist because it could not leave port due to weather. Even if there had been a tug at sea it could neither have prevented the grounding nor been more successful than subsequent efforts to pull the vessel off the beach. To have extracted a single sentence from the Coast Guard Report is a misrepresentation of the facts of the case.
- Without assurance that funding would be from the federal general fund or a partnership with the state there could be no support for the initiative because the industry can not assume this additional cost.
- Once one tug is in place there will be a push for at least two other ports within Washington State. Two or more in Oregon and four or five in California.
- \$4.5 m in additional funding for the Canadian Coast Guard would undergo scrutiny as to the best place to be spent.
- The U.S. Coast Guard is also critically short of funds.
- To fill the voids in tug coverage in the outer strait on a continuing basis through the spot chartering of tugs would for practical purposes cost the same as a dedicated tug. ITOS has never professed to be able to cover the outer coast.
- Regarding the issue of trade for the past 10 years, trade to the U.S. West Coast including British Columbia has been growing on a year on year average of about 7 %. California has been growing at greater than 8 %, while the Pacific Northwest (PNW) (Seattle, Tacoma and Vancouver) has grown at approximately 6 %.
- During that same period the number of carriers competing in the Pacific Trade to the PNW has declined by about 30%. Further consolidation of the container industry has taken place as the result of mergers and sailing agreements, which reduce the number of calls. In addition, the ships are newer, larger, and equipped with more modern aids to navigation, computerized radar tracking of traffic and redundant systems. In the general cargo area, forest products have been steady to declining for the past ten years and the projections are for reduced volumes.
- There is no question, within plus or minus about 10 percent year on year, that vessel calls for the past 10 years have not increased. They have remained steady or declined for the combined reasons cited above.

**Vote:**

Members Present:	19*
Yes:	11
No:	4
Stand Aside:	2

\*Includes the Panel's two non-voting co-chairs.